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1905

W. A. Kellerman, Ph. D.

Ohio State University

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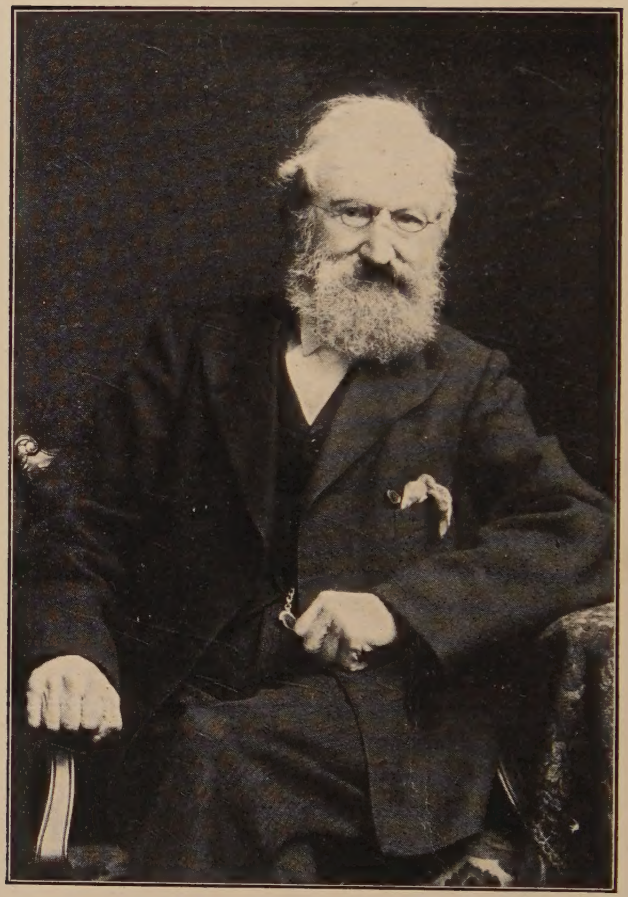

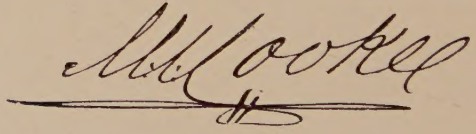

EMINENT PIONEER MYCOLOGIST OF LONDON.

# MYCOLOGICAL BULLETIN

## No. 25

*W. A. Kellerman, Ph. D., Ohio State University.*

*Columbus, Ohio, January* 1, 1905

THE NEW DEPARTURE.—Beginning with the issue of this number, the MYCOLOGICAL BULLETIN will be made a Semi-monthly publication. It has been sent out heretofore as an experiment, so to speak—at least it was not certain that approximately a thousand persons would care to pay for such a periodical. There are not, to be sure, 1,000 names yet on the mailing list, but if all who desire such a leaflet as this, knew of its regular issuance, price, and editor's address, it can safely be presumed that there would be an ample number of subscribers. Many persons have, to my knowledge, kindly called attention to the BULLETIN, and to these as well as other unknown friends, hearty thanks are extended.

FIG. 81. PSI-LOC'-Y-BE AM-MOPH'-I-LUS. An interesting little Toadstool found during the middle and latter part of the summer on Cedar Point beach at Sandusky, Ohio. The plants grow only on the old stems of the Beach Grass (*Ammophila arenaria*). The plants are brownish or dark buff color and of size indicated in the illustration. There were immense quantities of the mushrooms and a test was made of the cooking qualities. It was edible, but found to be rather insipid. The half-tone was made from photographs of specimens first collected in the locality named above by Student Chas. E. Brown.

University Bulletin, Series 9, No. 3. Entered as Second Class Matter, Post-office at Columbus, Ohio.

## MYCOLOGICAL GLOSSARY.

*Abbreviations: nov. gen.* (or *n. g.*), new genus; *n. sp.*, new species; the Greek letter *mu*, micron or one-thousandth of a millimeter; 2-5x6-9" means 2 to 5 by 6 to 9 "lines" or twelfths of an inch.
*Aber'rant:* departing somewhat from the usual form or type.
*Abstriction:* separation by constriction near the end as in *conidia*.
*Acer'vuli:* tufts of hyphae bearing spores.
*Acetab'uliform:* shape of a shallow bowl.
*Acic'ular:* needle-shaped, like pine leaves.
*Acrog'enous:* produced at the top.
*Acrop'etal:* developing from base toward apex.
*Acu'leate:* with slender point.
*Acuminate:* having a long-drawn-out point.
*Adnate:* growing fast to; the gills attached to the stem as in the Fig.
*Adnexed:* said of gills when attached slightly or by the upper angle only.
*Aecid'ial spores:* those produced in the *Aecidium*.
*Aecid'ium:* the first fruiting stage of the Rusts, as the Violet Aecidium, etc.
*Aethal'ium:* fruiting plasmodium-like mass covered with a cortex in case of some of the Slime-moulds.
*Ag'aric:* a gill-bearing mushroom.
*Agar'icoid:* like an Agaric, or mushroom-like.
*Allan'toid:* narrowly-oblong or sausage shaped.
*Allia'ceous:* with odor of onions.
*Alluta'ceous:* of pale brown color, like leather.
*Amor'phous:* without definite form.
*Amphig'enous:* produced on both sides or all around.
*Amyla'ceous:* starchy, like or containing starch.
*Am'ylum:* starch.
*Analogy:* resemblance in function and perhaps in external form, but fundamentally different in structure or origin, see *morphology*.
*Anas'tomose:* to run together irregularly or netlike.
*An'nulus:* the ring on the stem, see mushroom for illustration.
*Anterior:* said of the end of the lamella next to the margin.
*Apic'ulate:* having a short, abrupt point.
*Apic'ulus:* a short abrupt point.
*Apothe'cium:* used in connection with the Ascomycetes where the fructification is more or less cup-shaped and having the hymenium (fruiting surface) on its concave surface; ascoma.
*Appendic'ulate:* with an appendage, or hanging in small fragments.
*Ap'planate:* flattened out or horizontally expanded.
*Appressed:* applied closely to the surface or to each other.
*Approximate:* said of gills which do not quite reach the stem.
*Aqueous:* may be watery, or merely lacking color, that is, hyaline.
*Arach'noid:* like a cobweb, as is the veil in some mushrooms.
*Are'olate:* divided into little patches or areas.
*Argilla'ceous:* resembling clay.
*Ascending:* said of lamellae in a conical pileus; said of the partial veil in its young stage when its marginal attachment is below its stem attachment.
*Ascig'erous:* bearing asci.
*As'cocarp:* the spore cap or fructification in *Ascomycetes*.
*Asco'ma:* the *apothecium* or fruiting body in Lichens, Pezizae, etc.
*Ascomyce'tes:* the group of fungi whose spores are borne in asci.
*As'cospores:* the spores borne in an ascus.
*As'cus* (pl. *os'ci*): a cell in which spores are borne.
*As'tomous:* without an aperture or mouth.
*Atten'uate:* gradually narrowed.
*Aurantia'ceous:* orange colored.
*Au'reus:* golden; yellow with a tinge of red.

[TO BE CONTINUED.]

THE PURPOSE?—Yes, it is a Leaflet for *beginners* and *amateurs;* it contains much in the way of pictures and little in the way of reading matter. The long hard names are divided into syllables with accent indicated. It is hoped that the explanations in connection with the illustrations will be found full enough for the ordinary mycophagist or mycologist. Other paragraphs containing erratic remarks, timely suggestions, and occasional matter with scientific tinge, may be pardoned—at least endured.

SUBSCRIPTION.—It seems best to call attention to the present plan, according with universal custom, that when a name is placed on the mailing list the party is a regular subscriber and will be expected to pay the subscription price until the subscription is ordered stopped. This will leave my estimable subsrcibers only this one little thing to remember, namely, to send a quarter (25 cents) on the first day of January each year. Occasional reminder, if perchance necessary, will of coures give no offence to either party involved.

GLOSSARY OF TECHNICAL TERMS.—After some hesitation it has been decided to devote one page in a half dozen or more consecutive numbers to a brief illucidation of the technical terms generally employed in the books to describe Mushrooms and other common fungi. This will not be entertaining reading matter, I dare say, but certainly such a little dictionary will prove useful on many occasions. A few of the terms are very uncommon or used in a very peculiar sense—and doubtless all amateurs as well as beginners will find reference to the *second page* of the several BULLETINS for the winter and spring not an unprofitable, even if not the most agreeable employment.

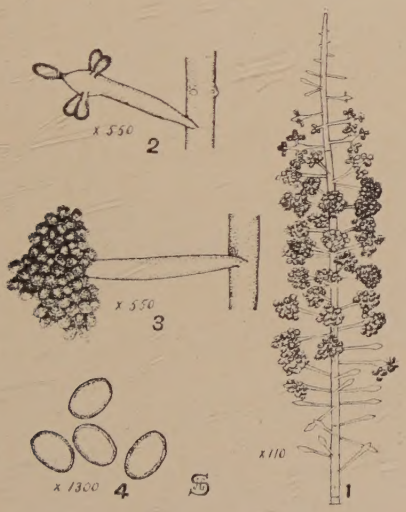


FIG. 82. BO-TRY-SPO'-RI-UM PUL'-CHRUM. This is a beautiful fungus belonging to the large group of *Hy-pho-my-ce'-tes*, all of which bear *co-nid'-i-a* on simple or branching hyphae above the surface or matrix on which they grow. They have no perithecia or pycnidia. Some of the forms are extremely ornamental, and all often are supposed to be stages of other fungi; for this reason these forms are called "*imperfect* fungi." In only a few cases, however, have they been identified by experiment as being connected with higher fungi. The plant here figured was found on dead stems in the green house, from which the illustrations were drawn by J. G. Sanders. This species has been described no less than nine times and given nine different names (the writer apologizes for the last mistake in this connection), but the name here used is that first given by Corda in 1839. Many botanists here as well as abroad have detected this fungus.

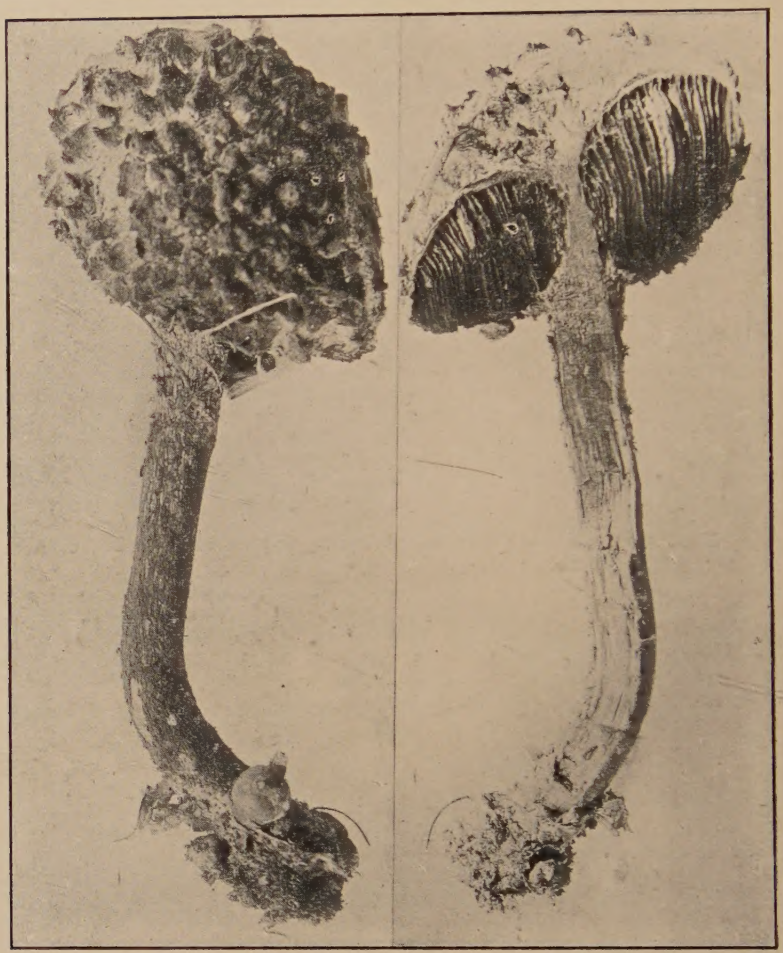

FIG. 83. STRO-BI-·OM'-Y-CES STRO-BI-LA'-CE-US. A tube bearing mushroom, belonging to the family *Bo-le-ta'-ce-ae*. Its peculiar appearance renders it easy of recognition. The half-tone was made from photograph of specimens collected in sandy soil of woods at Cedar Point, Sandusky, Ohio, August, 1904. McIlvaine says: "With many this Boletus is a prime favorite. It has a strong woody taste, sometimes musky, sometimes faintly of anisette. It cooks well by any method.

AT A DISTANCE.—The editor will have arrived at Guatemala (Central America), before this number of the BULLETIN reaches the subscribers. At a long distance therefore the next half dozen or more BULLETINS will be edited. In spite of care on the part of my faithful assistant, Miss Clara G. Mark, some mistakes may occur in the matter of distribution, correction of addresses, financial records, etc. A rich botanical field is to be visited; perhaps there may later some account be given of an interesting Mushroom or two way off from home, where it is summer all winter—and therefore, dear reader, I crave your indulgence, and run to catch the boat.

The Mycological Bulletin is issued on the 1st and 15th of each Month. Price 25c. Copies of Vol. II (1904) may be had for 50 cents each, or cloth bound copies for 75 cents. No copies remain of Vol. I (1903) except a few cloth bound for which 75 cents is charged.

# MYCOLOGICAL BULLETIN

## No. 26

*W. A. Kellerman, Ph. D., Ohio State University*

*Columbus, Ohio, January* 15, 1905

THE GENUS STRO-BI-LOM'-Y-CES.—In the family *Po-ly-po-ra'-ce-ae* to which this belongs, pores instead of gills from the lower side of the cap and constitute the *hy-me-ni-um*, or spore-bearing layer. The common genera are: (1) *Fis-tu-li-na*, which has the pores close together but free from each other—all the others have the pores *joined* side by side; (2) *Po-ly-po-rus*, firm, often corky or woody; (3) *mer-u-li-us*, with tubes or pores shallow, formed by a network of folds or wrinkles, plants somewhat gelatinous; (4) *Bo-le-tus*, not woody or corky, the mass of tubes easily separable from the cap when pulled off; (5) *Stro-bi-lom-y-ces*, the stratum of tubes not so easily separating, and cap with coarse prominent scales. Both the generic and specific name of the common species refer to its slight resemblance to a pine-cone. This character readily separates it from a *Boletus*. The flesh is whitish, but changes to reddish and later to black when wounded or cut.

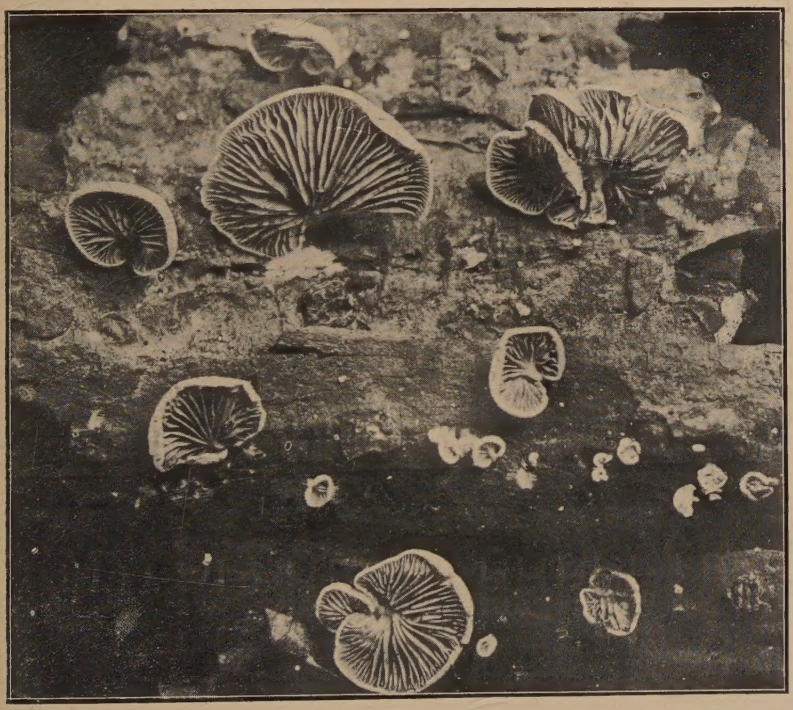

FIG. 84. CREP-I-DO'-TUS VER-SU'-TUS. An ochre-spored, white-capped little Mushroom not uncommon on stumps and logs. It may grow on the under side of logs and be resupinate; the cap is shelving when attached to sides of logs and stumps. The plants are shown natural size and on their usual substratum—an old log. The halftone was made from a photograph of specimens collected at Sandusky, Ohio.

University Bulletin, Series 9, No. 4. Entered as Second Class Matter, Post-office at Columbus, Ohio

## MYCOLOGICAL GLOSSARY.

*Auric'ulate:* ear shaped.
*Auton'omous:* said of plants that are complete in themselves and not a part only of the life cycle.
*Bad'ious:* bay, chestnut color, or reddish brown.
*Basidiomce'tes:* the group of fungi that have spores borne on a basidium.
*Basid'iospore:* spores borne on a basidium.
*Basid'ium* (pl. *basidia*): an enlarged cell on which are borne spores.
*Basip'etal:* proceeding toward the base.
*Bay:* a rich dark reddish chestnut.
*Biloc'ular:* having two cavities.
*Biog'enous:* growing on living plants or animals.
*Booted:* said of a mushroom stem when encased in a sheath.
*Boss:* an umbo, or short rounded protuberance.
*Byssa'ceous* or *byssoid:* of fine filaments or byssus.
*Bys'sus:* a fine filamentous mass.
*Caes'pitose:* growing in tufts or clumps.
*Campan'ulate:* bell shaped.
*Can'cellate:* latticed.
*Canes'cent:* having whitish or hoary pubescence.
*Cap:* pileus of mushrooms.
*Capilli'tium:* capillary threads mixed with the spores in case of some species.
*Carbona'ceous:* rigid, black and brittle.
*Car'inate:* with a keel or longitudinal line.
*Car'neous:* flesh color.
*Car'nose:* flesh color.
*Castan'eus:* chestnut color.
*Cau'date:* having a slender or tail-like appendage.
*Caulic'olous:* growing on herbaceous or woody stems.
*Cell:* the minute living mass of protoplasm which is the unit of structure in organisms. The vegetable cell has a cell-wall in case of mushrooms and common plants.
*Cel'lular:* composed of cells.
*Cel'lulose:* the chemical substance (a carbohydrate) of which the vegetable cell-wall is composed.
*Cera'ceous:* like wax.
*Cere'briform:* brain-shaped.
*Ces'pitose:* growing in tufts or clumps.
*Chartaceous:* like paper.
*Chlam'ydospores:* resting spores in rows formed by the breaking up of a hypha into bead-like cells.
*Cil'ia* (plural of *cilium*): marginal hairs or hair-like projections.
*Cil'iate:* with cilia.
*Cine'reous:* light bluish-gray, or ash-gray.
*Circumscis'sile:* breaking at or near the middle on equatorial line.
*Clath'rate:* latticed.
*Cla'vate* or *Clav'iform:* club-shaped, thickened toward top.
*Cluster-cups:* the first stage (Aecidium) of the Rusts.
*Col'loid:* like glue or jelly, not crystalline.
*Columel'la:* a stalk extended into or through a spore case.
*Comate, comose, comous:* with a tuft of silky hairs, or hairy.
*Com'planate:* flattened to a level surface above and below.
*Concat'enate:* linked together in a chain.
*Concep'tacle:* a closed spore-receptacle.
*Concol'orous:* of a uniform color.
*Concres'cent:* growing together.
*Concrete:* grown together.
*Confer'void:* loose and filamentous, like the alga *Conferva.*

[TO BE CONTINUED.]

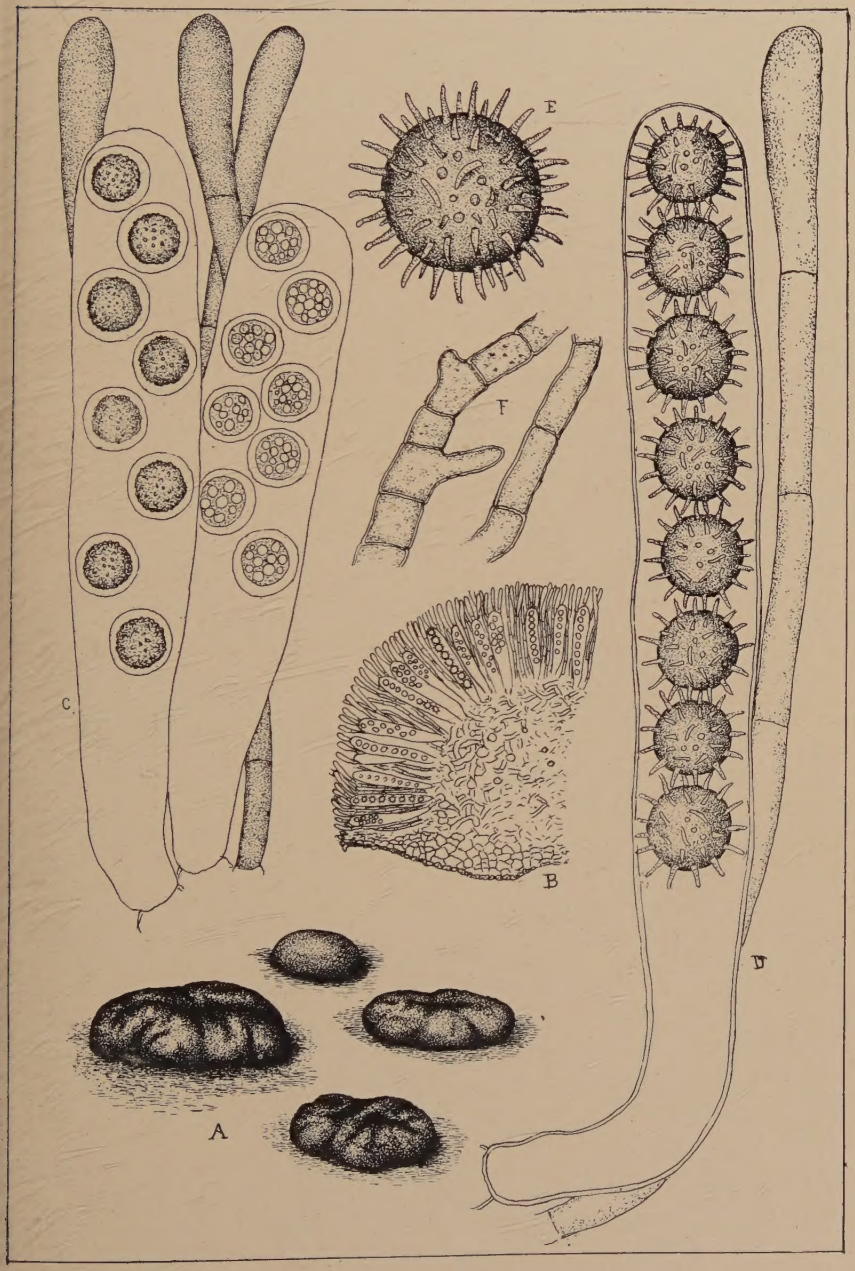


FIG. 85. SPHAE-RO-SO'-MA E-CHIN-U-LA'TUM. (See next page for explanation.)

EXPLANATION OF FIG. 85.

FIG. 85. SPHAE-RO-SO'-MA E-CHIN-U-LA'-TUM. The illustrations show the fungus in its several stages of development and its microscopic structure. Four plants are shown at Fig. A, natural size—the smallest being in an early stage of development, the largest fully matured. Fig. B shows a small portion cut vertically from the hyme'-nium, or layer of as'ci, and paraph'yses, slightly magnified. Fig. C illustrates stages in spore-formation in the as'cus. Fig. D represents a ripe as'cus containing the mature spores, accompanied by a paraph'ysis; magnified 600 diameters. Fig. E shows a ripe spore with its prominent spines, magnified 1200 diameters. Fig. F is a portion of the myce'lium from the soil; magnified 1000 diameters. These figures were drawn by Mr. Fred. Jay Seaver from plants collected on damp soil between the tufts of grass in an open place in the margin of woods near Iowa City, Iowa, June to October. The plant is a species not heretofore known to botanists. Mr. Seaver is he auhor of the name and description. An extended article on this plant is found in the January number of the Journal of Mycology.

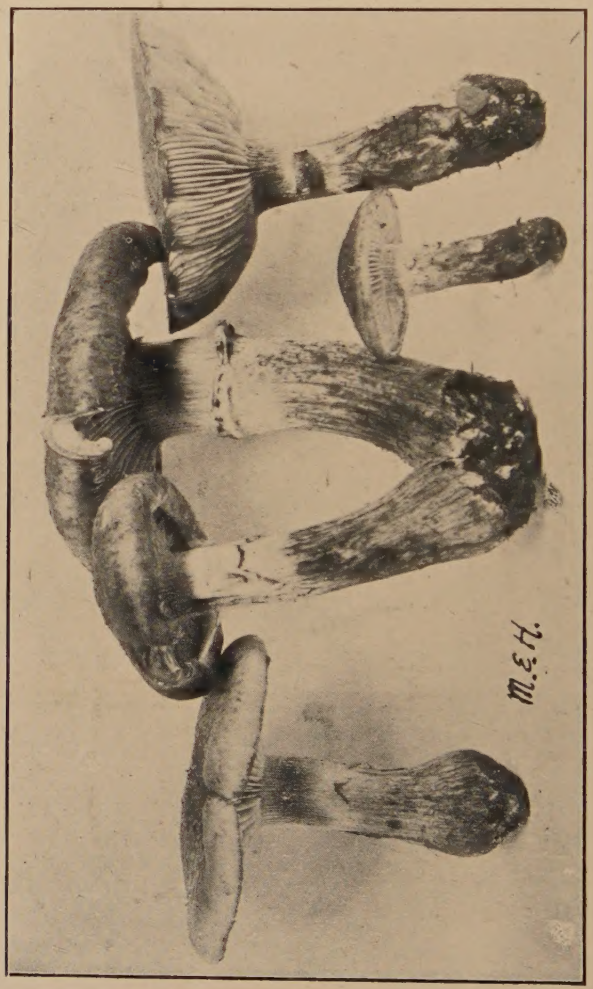


FIG. 86. AR-MEL-LA'-RI-A MEL'-LE-A. The Honey-colored *Ar-mil-la'-ri-a.* Edible A white-spored Agaric, the commonest of this genus, occurring late in summer and autumn. Photo by M. E. Hard, Chillicothe, Ohio.

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# MYCOLOGICAL BULLETIN

## No. 27

*W. A. Kellerman, Ph. D., Ohio State University*

*Columbus, Ohio, February* 1, 1905

WHAT MAKES THE FAIRY-RING?—Several mushrooms are arranged in circles, the so-called *Fairy-ring*. Explaining this matter in connection with the account of the common Fairy-ring Mushroom, *Ma-ras'-mi-us o-re'-a-des*, Professor Atkinson says: "Having started at a given spot the mycelium consumes the food material in the soil suitable for it, and the plants for the first year appear in a group. In the center of this spot the mycelium, having consumed all the available food, probably dies after producing the crop of mushrooms. But around the edge of the spot the mycelium or spawn still exists, and at the beginning of the next season it starts into growth and feeds on the available food in a zone surrounding the spot where it grew the previous year. This second year, then, the plants appear in a small ring. So in succeeding years it advances outward, the ring each year becoming larger. Where the plants appear only in the arc of a circle, something has happened to check or destroy the mycelium in the remaining arc of the circle.

It has been noted by several observers that the grass in the ring occupied by the mushrooms is often greener than that adjoining. This is perhaps due to some stimulus exerted by the mycelium which may in some way make certain foods available for the grass which gives additional supply to it at this point."

FIG. 87. UR'-NU-LA CRA-TE'-RI-UM. BLACK PE-ZI'-ZA. A very common and conspicuous *As-co-my-ce'-tous* or Cup-fungus, growing in clusters on rotten limbs and logs that lie in moist places. The *hy-me'-ni-um* or spore-bearing surface is the interior wall of the cup. The spores are at maturity shot out of the as'-ci, and can be seen sometimes by gently jarring the fungus when it is ready to make a discharge, as a little cloud an inch or two above the cup. The illustration was made from a photograph sent by T. E. Savage, Des Moines, Iowa.

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*Conid'ia:* plural of *condium.*
*Conid'ial:* pertaining to conidia.
*Conidiif'erous:* bearing conidia.
*Conid'iophore:* a hypha bearing conidia.
*Conid'ium:* a spore (non-sexual) arising singly or in chains from the ends of a hypha or hyphal branches.
*Con'text:* texture, substance.
*Continuous:* non-septate, applied to hyphae or spores that have no septa.
*Coria'ceous:* of a leathery texture.
*Cor'neous:* of a horny texture.
*Cor'tex:* outer, rind-like layer.
*Cor'ticular:* pertaining to or with a cortex
*Corti'na:* the web-like veil of the genus Cortinarius.
*Cor'tinate:* with a *cortina.*
*Cos'tate:* with a ridge or ridges.
*Crate'riform:* saucer-shaped, basin or crater-shaped.
*Cre'nate:* notched, indented or scalloped at the edge.
*Creta'ceous:* chalky or the color of chalk.
*Crib'rate:* sieve-like, or with small holes.
*Cri'nite:* with a tuft of long weak hairs.
*Cris'tate:* crested.
*Crusta'ceous:* of hard and brittle texture.
*Cryp'togam:* an old name for the "lower plants" or all those not included in the *spermatophytes* or flowering plants.
*Cu'neate:* wedge-shaped.
*Cus'pidate:* with a cusp or sharp point.
*Cu'ticle:* distinct skin-like layer or epidermis.
*Cyath'iform:* cup-shaped, slightly widened at top.
*Cym'biform:* boat-shaped.
*Cyst:* a bladder-like cell or cavity.
*Cystid'ium* (pl. *cystidia*): sterile cells of the *hymenium*, usually bladder-like, and different from the *basidia.*
*Decur'rent:* said of gills that are prolonged down the stem.
*Deliques'cent:* melting down, becoming liquid at maturity.
*Den'droid:* shaped like a tree.
*Den'tate:* toothed.
*Dentic'ulate:* with small teeth
*Descending:* applied to the veil in a young stage when its marginal attachment is below its stem attachment.
*Diagno'sis!* a technical description.
*Diaph'anous:* transparent or permitting passage of light.
*Dichot'omous:* regularly forked into two.
*Dic'tyoid:* the same as muriform.
*Did'ymous:* of two equal parts.
*Dif'fluent:* dissolving into a fluid, as of the gills.
*Dif'form:* not uniform.
*Dimid'iate:* halved, as a semi-circular sessile pileus attached to the plane edge; or a perithecium with the lower half wanting.
*Dimorph'ic:* existing in two forms.
*Disc (disk):* the hymenial surface, usually cup-shaped, of the *Discomycetes.*
*Discomyce'tes:* the *Ascomycetes* with hymenium exposed.
*Dis'crete:* distinct, not united.
*Divar'icate:* diverging widely.
*Eben'eous:* ebony black.
*Ebur'neous:* ivory white.
*Eccentric:* excentric, as stem not attached at center of pileus
*Ech'inate:* with stiff bristles.
*Echin'ulate:* with minute processes.
*Effused:* spread over and without regular form.

[TO BE CONTINUED.]

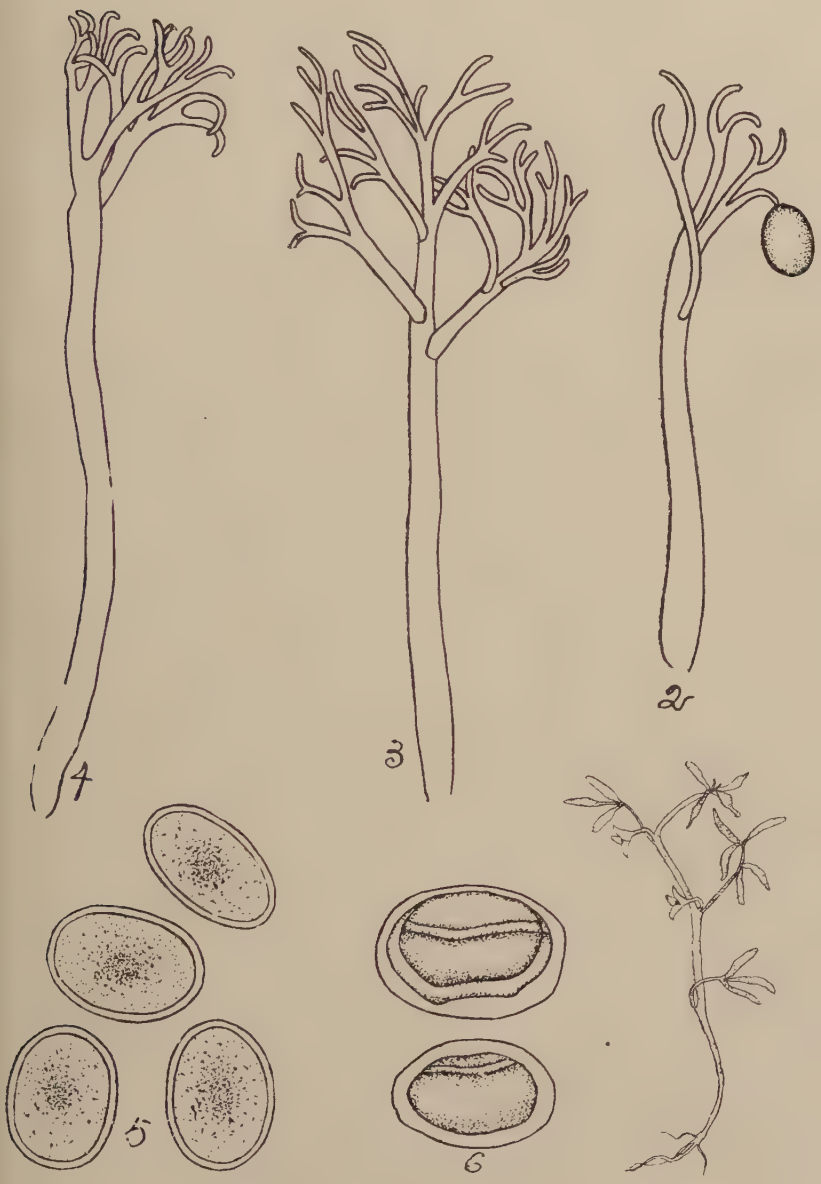


FIG. 88. PER-O-NOS'-PO-RA FLOER-KE'-AE. Leaf Mildew of False Mermaid.

(See next page for explanation.)

EXPLANATION OF FIG. 88.

FIG. 88. PER-O-NOS'-PO-RA FLOER-KE'-AE. Leaf Mildew of False Mermaid. This is is a parasitic fungus that attacks the little wild plants of the woods and shady places, called the False Mermaid. The Mildew is usually abundant on the lowest leaves and often covers the entire plant, stunting the growth of the host very much. Without a lens even the parasite can be seen when abundant, forming a powdery or white fuzzy covering over the epidermis. This consists of little branched hy'phae as shown in Figures 2, 3 and 4 on the opposite page (Fig. 88). These tree-like *co-nid'-i-o-phores*, as they are called, bear the spores, *i. e., co-nid-i-a;* one *co-nid'-i-um* is still attached in Figure 2. Four *co-nid'-i-a,* mature, are shown in Figure 5. Besides these spores—summer spores they are—there are others (as shown in Figure 6) that have thickened walls and can endure the winter. They germinate in the spring—the parasite is an annual plant. Those winter spores are formed within the tissues of the leaves and stems of the host. A plant much dwarfed by the attack of the parasite is shown also (Figure 1). This fungus is somewhat similar to the Powdery Mildew, or Grape Rot, that inflicts great damage on vine-yards. A full account of his new species, with technical description was given in the Journal of Mycology, July, 1904.

FIG. 89, MA-RAS'-MI-US O-RE'-A-DES. Fairy-Ring Mushroom.

EXPLANATION OF FIG. 89.

MA-RAS'-MI-US O-RE'-A-DES. FAIRY-RING MUSHROOM. EDIBLE. This interesting, widely distributed, common toadstool every one has seen in grassy places, in lawns, by roadsides, etc., during favorable weather in summer and autumn. While found often in circles, "fairy-rings," it may form only an arc of a circle or the plants may be somewhat scattered. The general character of the plant is well shown in the illustration. The cap is buff color, or tawny, or reddish; when dry it is paler. When moist, the cap may have striæ (ridges) on the margin. The gills are broad and free or adnexed. This is a highly prized plant. The half-tone is from a photograph sent by Supt. M. E. Hard, Chillicothe, Ohio.

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# MYCOLOGICAL BULLETIN

## No. 28

*W. A. Kellerman, Ph. D., Ohio State University*

*Columbus, Ohio, February* 15, 1905

THE GENUS PSI-LOC'-Y-BE.—This is a small group of the brown-spored Agarics, and the name from two Greek words, means *naked head.* Some authors accent the third syllable, thus, *Psi-lo-cy'-be.* In structure this is much like *Col-lyb'-i-a* (white-spored), *Lep-to'-ni-a* (rosy-spored), and *Nau-co'-ri-a* (ochre-spored), but its brown spores separate it from those genera. It has no veil, the stipe is tenaceous and 'continuous' with the pileus, the margin of the pileus is *at first incurved,* and the gills are not decurrent; these characters separate it from its near relatives in the group of brown-spored Agarics. Atkinson's Mushrooms Edible and Poisonous gives no species; McIlvaine's One Thousand American Fungi notes two species. Fig. 81 in this BULLETIN is not very common.

FIG. 90. MER-U'-LI-US RU-BEL'-LUS. RED MER-U'-LI-US. Not inedible, but tough. This species grows on rotten trunks, stumps, etc. It is more or less cespitose, imbricate and sessile, and of a soft and tenaceous texture. It is strongly tinged with red, but becomes pale when dry. The beautiful red-orange specimens from which the cut was made, were collected by Professor J. H. Schaffner and H. H. York, in a woods near Columbus, in October, 1904.

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## MYCOLOGICAL GLOSSARY.

*Egg:* applied to the young mushroom before the volva has ruptured in Phalloids, Amanitas, etc.
*Egut'tulate:* without guttae or guttulae.
*Emar'ginate:* with a notch; gills may be emarginate or with a sinus or notch near the stem.
*Endoperid'ium:* an inner layer of the peridium.
*En'dospore:* the inner coat or wall of a spore.
*Entomog'enous:* growing from insects.
*Epider'mis:* a distinct outer layer.
*Epig'enous:* growing on the surface of a plant.
*Epigae'us:* growing on the ground.
*Epiphyl'lus:* growing on the upper side of the leaf.
*Ep'ispore:* the inner coat or wall of a spore.
*Epithe'cium:* the layer sometimes formed on a hymenium by the union of the tips of paraphyses above the asci.
*Epix'ylous:* growing on wood.
*Erum'pent:* breaking through the epidermis or through the surface of the matrix.
*Excen'tric:* out of the center; as stem not attached to center of pileus.
*Excip'ulum:* outer layer of an *Apothecium.*
*Exoperid'ium:* outer layer of the peridium.
*Ex'ospore:* the outer coat or wall of a spore.
*Ex'planate:* flattened, expanded.
*Exser'ted:* projecting; standing out.
*Exsicca'ti:* dried specimens; sets of specimens.
*Facultative-parasite:* a fungus normally saprophytic but which may live for a time or a part of its life cycle as a parasite.
*Facultative-saprophyte:* a fungus normally parasitic but which may live for a time or a part of its life cycle as a saprophyte.
*Fal'cate:* hooked or curved like a scythe.
*Farina'ceous:* mealy.
*Far'inose:* covered with a white mealy powder.
*Ferru'ginous:* rust-red.
*Filiform:* thread-like.
*Fim'briate:* fringed.
*Fis'tulose:* with stem hollow, or becoming hollow.
*Flab'ellate:* fan-shaped.
*Flabel'liform:* fan-shaped.
*Flac'cid:* soft and flabby.
*Flaves'cent:* turning yellow or yellowish.
*Floc'cose:* woolly, with woolly locks or flocci.
*Floc'culose:* minutely fluccose.
*Fo'veate:* with pits on depressions.
*Fovc'olate:* with small pits.
*Free:* said of gills not attached to the stem.
*Fri'able:* easily crumbling.
*Fuga'ceous:* falling or fading early, disappearing.
*Fuligin'eous, fulig'inous:* sooty-brown or dark smoke color.
*Ful'vous:* tawny, yellowish-brown tint.
*Fun'gus* (pl. *fungi*): mushrooms and other "low" plants that are of simple structure, destitute of chlorophyll and consequently must live as parasites or saprophytes.
*Furfura'ceous:* with brown scales.
*Fus'cous:* dingy, brownish, or brown tinged with gray.
*Fu'siform:* spindle-shaped.
*Fusoid:* like a spindle; fusiform.
*Gasteromyce'tes:* those *Basidiomycetes* in which the hymenium is enclosed in a sack-like envelope, as the Puffballs.

[TO BE CONTINUED.]

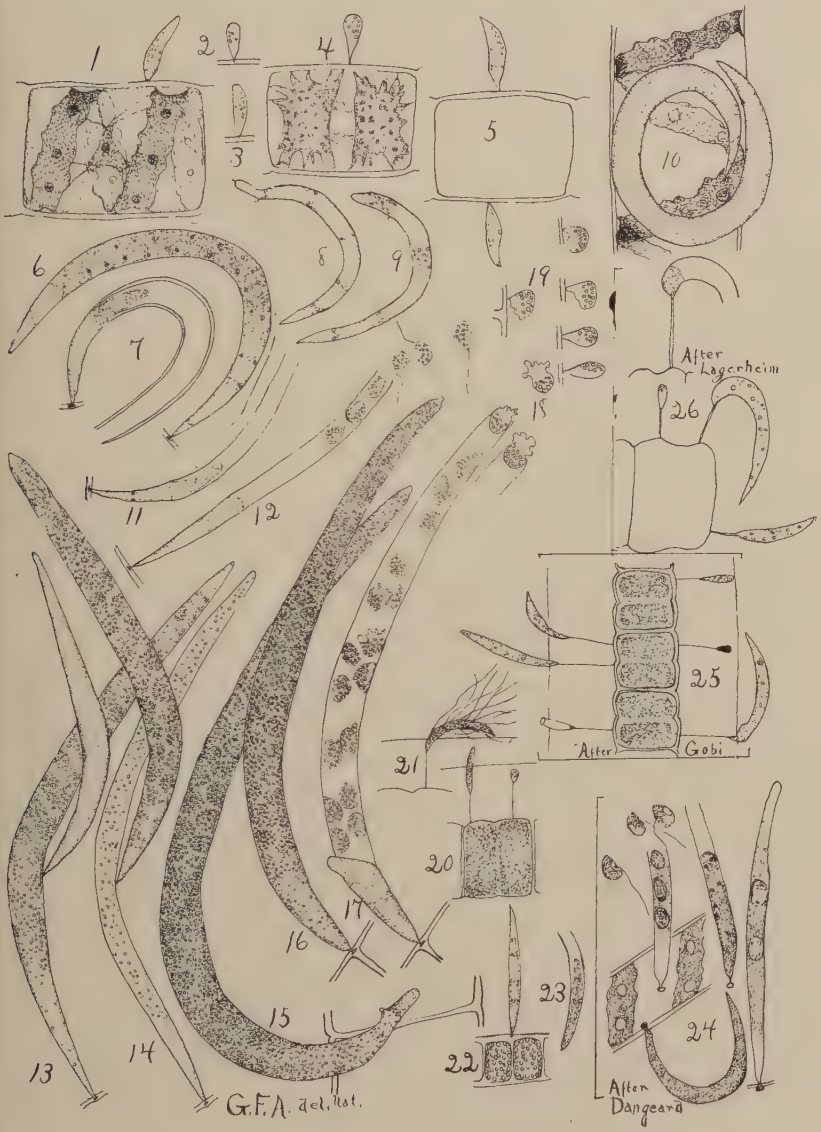


FIG. 91. Three species of HAR-PO-CHYT'-RI-UM.

This plate represents the structure, habit and life-history of a very interesting genus of fungi parasitic on Algae, a full account of which was published recently by Professor Atkinson in a German periodical. The plate with notes was reproduced in the Journal of Mycology, whence we transcribe the main portion of the explanation of the plate.

HAR-PO-CHYT'-RI-UM HEDENII, Willie.

Figs. 1, 2, 3, 4, 5, Young stage of plant on *Spirogyra* and *Zygnema*, developed in cell culture. Fig. 6, Mature plant.

Fig. 7, Old plant with two empty sporangia and young tertiary sporangium growing out in the old secondary one.

Figs. 8, 9, Plants half grown showing large and long vacuoles separated by granular protoplasm. Both of these plants became freed from their attachment to the host, the one illustrated in Fig. 8 was attached at two points, one point directly at the base, the other upon the side a short distance from the end. The plant in Fig. 9 was attached at one point on the side, a little distance from the end. Here the short, slender stalk and the disk-like expansion is shown.

Fig. 10, Plant coiled in the form of a serpent on the side of the *Spirogyra* thread.

Fig. 11, Old plant with empty sporangium and young secondary sporangium developing within.

Fig. 12, Mature plant, zoospores escaping, sterile, basal part limited by thin wall which is arched outward slightly because of the endosmotic pressure in the protoplast, and the removal of the pressure within the primary sporangium.

Fig. 13, One individual of *Har-po-chyt'ri-um* attacked by another, the parasitic one one-half the size and age of the host individual.

Fig. 14, Later stage, showing degeneration of the host individual and the increased size of the parasitic individual.

Fig. 15, Mature individual attached at the side a short distance from the base.

Fig. 16, Mature individual attached at the end at a point between two adjacent *Spirogyra* cells.

Fig. 17, Same plant with zoospores escaping. This plant was kept in cell culture and the secondary sporangium from the sterile basal part began to grow before the developed zoospores escaped, and was forced out slightly at one side. The apex of individuals in Figs. 15, 16, show the peculiar condition shortly before formation of zoospores. In Fig. 17, amoeboid movement of some zoospores shown in the sporangium and also escaping.

Fig. 18, The zoospore after escaping, still showing amoeboid movement.

Fig. 19, Five individuals showing stages in attachment and elongation of zoospores. Figs. 6, 7, 11, 12, 13, 14, show the disk-like holdfast and absorbent disk between the outer and inner lamellae of cell wall.

Figs. 1-19 from specimens collected at Ithaca, N. Y. Fig. 24, after Dangeard.

HAR-PO-CHYT'-RI-UM HYALOTHECAE, Lagerheim.

Fig. 20, Showing two young individuals attached to cell of host (Hyalotheca dissiliens), one of the zoospores still within the slime and just having developed the slender stalk; the other individual, the zoospore having elongated and the outer end projecting beyond the slime sheath.

Fig. 21, Mature individual attacked by a filamentous bacterium.

Figs. 20, 21, from specimens collected at Ithaca, N. Y. Fig. 25, after Gobi. Fig. 26, after Lagerheim.

HAR-PO-CHYT-RI-UM INTERMEDIUM, Atkinson.

Fig. 22, Half grown individual attached to *Conferva utriculosa*, showing disk-like haustorium between outer and inner lamellae of cell wall.

Fig. 23, Mature individual with empty primary sporangium, and young secondary sporangium developing. Figs 22, 23, from material collected at Ithaca, N. Y.

THE GENUS CA-LOS'-TO-MA.—This is a small group of *Gas-tro-my-ce'-tous* fungi having some affinity with the common Puffballs. A very good account is given of the American species by Mr. C. E. Burnap, in the Botanical Gazette, of March, 1887, Vol. 23, p. 180-192, with plate. His study was based mainly on the commonest species. He says: "The fact that this fungus passes its early stages just below the surface of the ground and is usually protruded only after the elements of the *gleba*, or spore bearing portion have disappeared by absorption, renders it difficult to procure in a young condition. At maturity *Colostoma cinnabarinum*, which is the most common American species and may serve as a type for the whole genus, presents the appearance of an ochraceous globose body opening above by a stellate mouth guarded by tooth-like valves, and extending below into a footstalk composed of anastomosing strands. The gleba lies at the center of the globose body, and is surrounded in its younger stages by four layers: (1) the volva, an outer gelatinous layer which soon disappears; (2) the exoperidium, a layer just within the volva, also breaking away at an early stage; (3) the endoperidium, which is the external layer in older specimens; and (4) the spore sac containing the gleba." There are four American species, namely, *Ca-los'-to-ma cin-na-ba-ri'-num*, *Ca-los'-to-ma lu-tes'-cens*, *Ca-los'-to-ma ra-ve-nel'-li*, and *ca-los'-to-ma mi-cro-spo'-rum*. The name *Ca-los'-to-ma*, formed of two Greek words, means *beautiful mouth*. Some authors use the name *Mi-trem'-y-ces* instead —but this is not the original name and hence not tenable.

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# MYCOLOGICAL BULLETIN

## No. 29

*W. A. Kellerman, Ph. D., Ohio State University*

*Columbus, Ohio, March* 1, 1905

THE GENUS CREP-I-DO'-TUS.—About a dozen American species belong to this genus which is described as follows by Atkinson: "In *Crepidotus* the pileus is lateral, or eccentric, and thus more or less shelving, or it is resupinate, that is, lying flat or nearly so on the wood. The species are usually of small size, thin, soft and fleshy. The spores are reddish brown (ferruginous). The genus corresponds to *Pleurotus* among the white-spored agarics, or to *Claudopus* among the rosy-spored ones." Fig. 84 shows a very common species on logs and stumps in shady woods.

FIG. 92. AR-MIL-LA'-RI-A MEL'-LE-A. Photo by Frank H. Cloyes, Waltham, Mass. Same species as Fig. 86.

University Bulletin, Series 9, No. 7 Entered as Second Class Matter, Post-office at Columbus, Ohio

## MYCOLOGICAL GLOSSARY.

*Ge'nus:* a group of closely related species.
*Gib'bous:* swollen at one point.
*Gills:* the *lamellae* or plates in an Agaric on which the basidiospores are borne.
*Glab'rous:* smooth, devoid of pubescence or hairiness.
*Glau'cous:* with a whitish waxy bloom.
*Gle'ba:* in Gasteromycetes the spore-bearing cavernous tissue, as the Puff-balls and Phalloids.
*Gonid'ium:* same as *Conidium*, but formerly used only for the green bodies (algae) in the tissue of Lichens.
*Grega'rious:* said of Mushrooms not solitary, but many in a locality growing together, yet not caespitose.
*Gut'ta* (pl. *guttae*): drops or included oil-globules.
*Gut'tate:* with tear-like drops or guttae.
*Gut'tula* (pl. *guttulae*): small drops or minute included oil-globules.
*Gut'tulate:* with guttulae.
*Gymnocar'pous:* with exposed hymenium at maturity.
*Gyrate, gyrose:* wavy folds or like the brain convolutions.
*Hab'itat:* the natural place of growth of a plant.
*Hausto'rium* (pl. *haustoria*): a special branch of a hypha or projection that acts as a sucker and holdfast for a parasitic fungus.
*Het'eroecism:* living on more than one host during the life-cycle; for example one Wheat Rust has its first stage on Barberry leaves.
*Hir'sute:* with stiff hairs.
*Host:* the plant or animal on which a parasitic fungus grows.
*Homol'ogous:* said of parts having fundamental likeness in structure or of corresponding origin; analogy refers to similarity merely in function; homology takes into account only structure and origin.
*Hy'aline:* transparent, clear like glass.
*Hygromet'ric:* readily absorbing water.
*Hygroph'anous:* watery appearance when moist, but opaque when dry.
*Hygroscop'ic:* absorbing moisture from the air.
*Hyme'nium:* the fruit-bearing (spore-bearing) surface.
*Hymenomyce'tes:* those Basidiomycetous fungi which have the hymenium exposed.
*Hy'menophore:* the portion which bears the hymenium.
*Hy'pha* (pl. *hyphae*): one of the elongated cells or filaments of which the fungus is composed.
*Hy'phal:* pertaining to a hypha.
*Hyphomycet'es:* the "imperfect fungi" whose conidia are borne on superficial often floccose hyphae, pycnidia absent.
*Hypocrate'riform:* of the form of a cylindrical cup with outwardly turned margin; salver-form.
*Hypogae'ous:* below the surface of the ground.
*Hypog'enous:* growing on the under side.
*Hypophyl'lous:* growing on the under side of a leaf.
*Hypothal'lus:* a membranous or fleshy base to perithecia or sporangia
*Hypothe'cium:* the hyphal layer beneath the hymenium.
*Hyste'rioid:* elongate boat-shaped, like one of the group of *Hysteriaceae*.
*Im'bricate:* overlapping like shingles.
*Imperfect fungi:* those fruiting stages of fungi which precede the form that represents the final stage in the life-cycle of the species.
*Incar'nate:* flesh-colored.
*Indehis'cent:* not opening at maturity as an indehiscent peridium.
*Indu'sium:* in Phalloids it is the veil beneath the pileus.
*Inferior:* as the ring of an Agaric far down on the stem.
*Infundib'uliform:* funnel-shaped.
*Innate:* within or blending with the substance of a part.

[TO BE CONTINUED.]

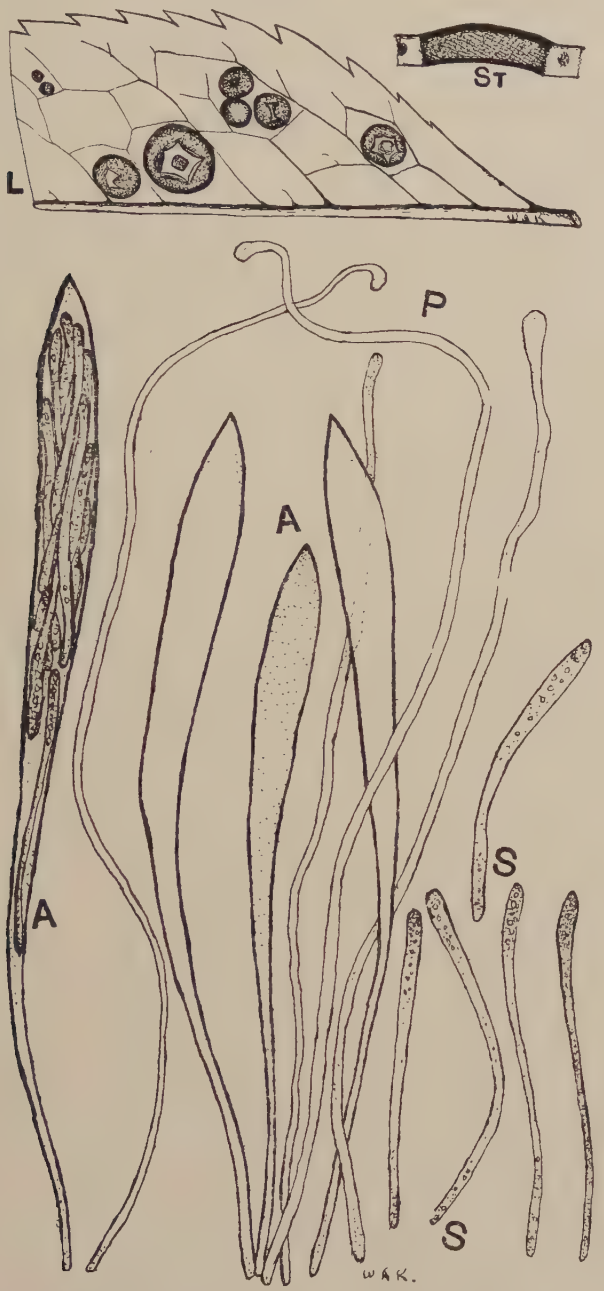


Fig. 93. Rhy-tis'-ma con-cav'-um. A parasitic fungus on *Ilex verticillata* (Winter-berry). At *L.* is shown the leaf with the ripe fungus natural size; a section, slightly magnified, at *St.* The other figures show the microscopic structure.

FIG. 94. GA'-LE-RA SPHAG'-NUM. This charming little Toadstool grows, as the cut shows, on the lower dead portion of the stems of Bogmoss or *Sphagnum*. It belongs to the section of ochre-spored Ag'arics. The specimens were collected on a cranberry island in Buckeye Lake, the latter part of October, 1904.

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# MYCOLOGICAL BULLETIN

## No. 30

*W. A. Kellerman, Ph. D., Ohio State University*
*Columbus, Ohio, March* 15, 1905

PARASITIC FUNGI.—It is easier to tell the difference between saprophytic and parasitic fungi than it is to draw the line of demarkation in all cases. Some fungi are purely parasitic and others are just as distinctly saprophytic. That is, some species (*parasites*) take their food directly and exclusively from living plants and animals; the saprophytes, on the other hand, live on decaying organic matter. It is now known that some saprophytic forms may for a time at least adjust themselves to a parasitic mode of life—or as a botanist would say, they are *facultative-parasites*. Again, some parasites are able to live for a time on dead organic matter—they are therefore *facultative-saprophytes*. Some species of a given genus may be parasitic, and others—though of the same genus—may be classed with the saprophytes; but such cases are not numerous. The common Mushrooms and Toadstools—for the illucidation of which this BULLETIN has its reason d'etre—are usually very conspicuous, exhibit manifold forms, and varied colorings. The parasitic species on the contrary, are mostly inconspicuous, indeed microscopic, and known chiefly by their devastations. Innumerable discolored areas on leaves, conspicuous spots because the tissue is dead and bleached or may be peculiarly colored, may indicate the presence of a parasitic fungus—yet to detect the latter a hand lens may be necessary, and only with the aid of a compound microscope can the form and structure of the fungus be determined

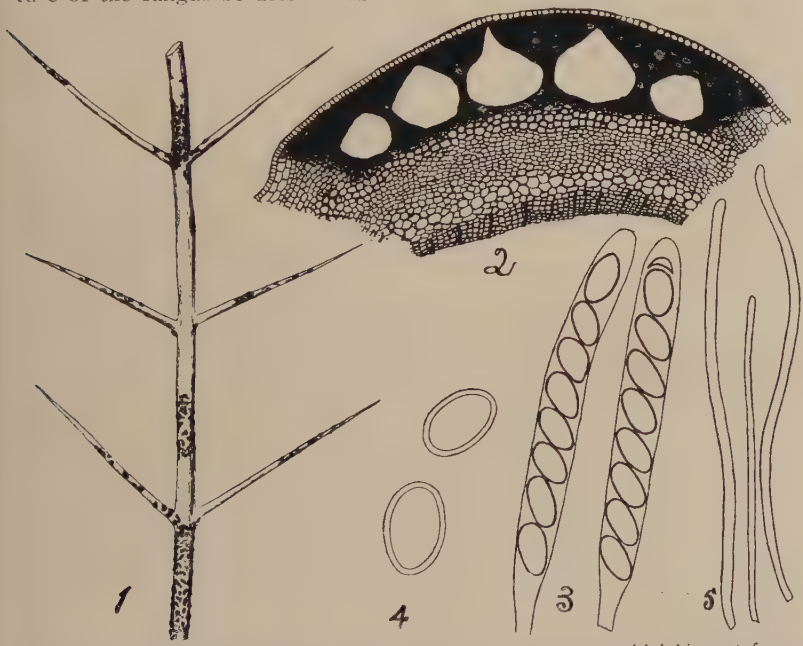


FIG. 95. PHYL-LACH'-O-RA MEX-I-CA'-NA. A parasitic fungus on *Adolphia* sent from Mexico. The stem (Fig. 1) is attacked by the fungus and forms blackened areas. Figure 2 shows a section through the part of the stem which is affected and the *stro'-ma* (as the black solid part of the fungus is called) is seen to be occupied by cavities in which as'ci and ascospores are formed; the latter are illustrated in Figures 3 and 4. Figure 5 shows some of the *pa-raph'-y-ses* which are mixed with the as'ci. This, a new species when collected last summer, was sent by Professor A. L. Herrera, of Mexico City, Mexico.

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## MYCOLOGICAL GLOSSARY.

*Insiti'tious:* inserted.
*Inter'calary:* inserted between.
*In'tercel'lular:* between cells.
*In'tracel'lular:* within the cell.
*Intumes'cent:* becoming swollen.
*Invag'inated:* sheathed.
*In'volute:* rolled inwards.
*Isabel'line:* color of sole leather, brownish yellow.
*Lac'cate:* varnished or coated as with ceiling wax.
*Lacerate:* irregularly torn.
*Laciniate:* cut into many lobes or threads.
*Lactes'cent:* with milky juice.
*Lacu'na:* a pit or cavity.
*Lac'unose:* pitted.
*Lamel'la* (pl. *lamellae*): gill of a mushroom bearing the hymenium.
*La'nate:* woolly.
*Lateri'cious:* of brick color.
*La'tex:* milky juice of plants.
*Laticif'erous:* bearing latex.
*Lax:* not compact, flaccid.
*Lep'idote:* scurfy with minute scales.
*Leucospor'ae:* the group of Agarics that have white spores.
*Lev'igate:* with a polished surface.
*Lig'natile:* growing on wood.
*Lig'neous:* growing on wood.
*Lig'ulate:* flattened and strap-like.
*Liv'id:* bluish-black, color of a flesh bruise.
*Loc'ular:* divided into cavities; as trilocular, three cavities.
*Lu'men:* cavity; cavity formed by cell wall.
*Lu'rid:* color between purple, yellow and gray; dirty brown.
*Lu'teous:* yellowish; buff-like or clay color.
*Lutes'cent:* yellowish; becoming luteous.
*Mac'ulate:* spotted.
*Mam'miform:* breast-like; teat-like.
*Marginal veil:* in Agarics the veil extending from margin of pileus to stem.
*Ma'trix:* the substance on which or in which a fungus grows.
*Mc'dial:* as of an annulus when at the middle of the stem.
*Medul'la:* inner substance extending to the cortical portion.
*Melanospo'rae:* the black-spored Agarics.
*Meris'moid:* like Merisma, that is, a pileus divided into many small pilei.
*Mes'opod:* a plant having a central stem.
*Mica'ceous:* covered with glistening scales.
*Mic'ron* (pl. *micra* or *microns*): the $\mu$ or one-thousandth of a millimeter; it is nearly .00004 of an inch.
*Mil'limeter:* the thousandth of a meter, and a thousand micra, or $\mu$, nearly one twenty-fifth of an inch.
*Min'iate:* vivid red or vermillion color.
*Mi'trate, Mitriform:* bonnet-shaped, mitre-shaped.
*Mold, mould:* may refer to fine organic earth as leaf-mold, or to the common fungi on foods, etc., as Penicillium, Mucor, etc.
*Monil'iform:* like a string of beads.
*Morphol'ogy:* this as contrasted with Physiology (which deals with function) refers to structure of parts, particularly their interpretation as based on their origin and development.
*Mucc'dinous:* resembling the mildews or moulds.
*Mu'cro:* a short abrupt point.
*Mu'cronate:* with a short abrupt point.
*Multipar'tite:* divided into many parts.

[TO BE CONTINUED.]

FIG. 96. TRI-CHO-LO'-MA MEL-A-LEU'-CUM. This *Tri-cho-lo'-ma* was found in great abundance in the woods of Cedar Point, near Sandusky, Ohio, first brought to the laboratory by H. H. York. The size and general character of this white-spored Agaric are fully shown in the illustrations. It was found in sandy soil, growing singly in the shady woods. The color is usualy pale, nearly white at first, later much darker, but hardly sooty. Photograph from specimens collected near Sandusky, Ohio, August, 1904.

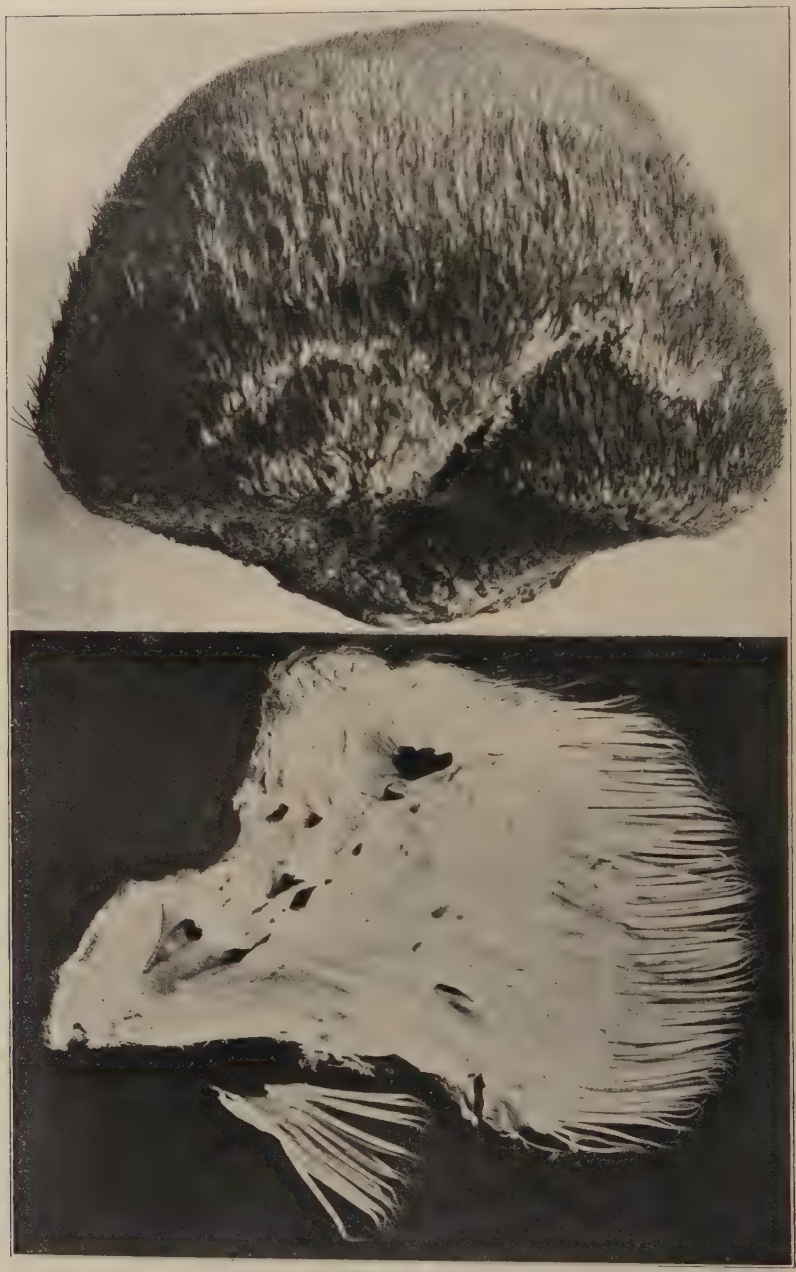

FIG. 97. HYD'UM ER-I-NA'-CE-US. SATYR'S-BEARD. EDIBLE. This common and attractive Hedge-hog fungus or Hyd'num was collected by Miss Luda B. Porter, Newark, Ohio.

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# MYCOLOGICAL BULLETIN
## No. 31

*W. A. Kellerman, Ph. D., Ohio State University*
*Columbus, Ohio, April* 1, 1905

PERHAPS REGULAR AFTER THIS.—An unexpected delay has occurred in issuing the April Nos. of the BULLETIN, due to late return from a winter trip to Guatemala. However, the 24 Nos. for the year will be received by the subscribers and possibly from now on they may be sent out regularly as dated. All who are not duly receiving the Nos. may know that we have not received the subscription (25 cents) for the year.

ACKNOWLEDGMENTS.—Two correspondents have made valuable contributions to this Number, namely, Mr. S. S. Crosby, of Massachusetts, and Dr. O. E. Fischer, of Michigan. Their photographs of interesting fungi are reproduced as Figs. 98 and 99.

HY-PHO-LO'-MA.—We present a habit-figure of *Hy-phy-lo'-ma ap-pendic-u-la'-tum* from a photo by Mr. S. S. Crosby, and will as opportunity offers try to show a plant the natural size. Figures of some other species may be seen on preceding pages. For example, *Hy-pho-lo'-ma sub-later-i'-ti-um* was shown on p. 25, made from a photo by Fred. J. Braendle; *Hy-pho-lo'-ma lac-ry-ma-bun'-dum*, from a photo by M. E. Hard, was published on p. 57; and *Hy-pho-lo'-ma cap-noi'-des* may be found on p. 92, printed from a cut furnished by L. F. Henderson. Some explanation of the genus was given on p. 73 and therefore need not be commented on here.

FIG. 98. HY-PHO-LO'-MA AP-PEN-DIC-U-LA'-TUM. Edible. The photo for this Appendiculate Hy-pho-lo'-ma was furnished by Mr. S. S. Crosby, Cambridge, Mass.

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## GLOSSARY.

*Multisep'tate:* having many partitions or septa.
*Mu'ricate:* covered with short hard points.
*Muric'ulate:* finely muricate.
*Mu'riform:* descriptive of spores that have septa at right angles to each other, or like bricks in a wall.
*Mu'rine* or *murinous:* mouse-colored.
*Mushroom:* a word used for all the conspicuous higher fungi; the term is not properly confined to the edible toadstools.
*Myc-* (*mycet-* or *myco-*): is a prefix meaning fungus.
*Myce'lium:* the mass of hypae or threads (elongated cells) of which the tissue of fungi is composed, especially the visible mat of hyphae of the moulds, etc.
*Myce'lioid:* like mycelium.
*Mycol'ogy:* the division of botany which treats of fungi.
*Mycol'ogist:* one versed in mycology.
*Mycoph'agist:* one who eats fungi.
*Ni'tid, nitidous:* shining, polished.
*Niv'eous:* snow-white.
*Nu'cleus:* the central dense and very complex part of the protoplasm.
*Obligate-parasite:* one that can grow only as a parasite; see Facultative-parasite.
*Obligate-saprophyte:* one that can grow only as a saprophyte; see Facultative-saprophyte.
*Ochrospor'ae:* the Agarics that have ocher-colored or brownish spores.
*Oö'spore:* a spore resulting from the act of fecundation, usually a resting-spore; egg-spore.
*Oper'culate:* with an operculum or lid.
*Oper'culum:* lid of a spore-case.
*Os'tiolate:* with an ostiolum.
*Os'tiole, os'tiolum:* orifice for exit of spores; mouth of perithecium.
*Pal'lid:* pale or of an undecided color.
*Papil'lose:* with minute rounded projections.
*Paraph'ysate:* with paraphyses.
*Paraph'yses:* slender cells, often clavate, etc., mixed with the asci, and are apparently sterile asci.
*Par'asite:* a plant that receives its nourishment direct from living plants or animals to which it is attached.
*Pari'etal:* pertaining to or on the wall.
*Partial veil:* in Agarics the veil reaching only from the margin of the pileus to the stem.
*Patel'late:* shape of a dish or pan (patella).
*Patel'liform:* shape of the patella or pan.
*Pec'tinate:* with teeth like a comb.
*Pel'licle:* a very thin skin or cuticle.
*Pellu cid:* translucent.
*Peridio'lum:* a secondary or interior peridium.
*Perid'ium:* the outer coat of a sporophore, as the covering in case of Puffballs, Geasters, etc.
*Perithe'cium* (pl. *perithecia*): a globular or otherwise-shaped receptacle in which asci (and ascopores) are produced; it may be closed or open above; ascoma, ascocarp, etc.
*Per'onate:* sheathed.
*Pezi'zoid:* cup-shaped or resembling a Peziza.
*Phycomyce'tes:* The Algal-fungi, as Grape Mildew (Peronospora), etc.
*Pi'leate:* having a cap or pileus.
*Pi'leus:* the cap-like or umbrella-like portion of an Ag'aric or other mushrooms; the pileus with the stem supporting it is the sporophore or so-called fructification.

[TO BE CONTINUED.]

Is Gy-ro-mi'-tra es-cu-len'-ta Poisonous?—Atkinson (Mushrooms, p. 220) says: "While this species has long been reported as an edible one, and has been employed in many instances as food with no evil results, there are known cases where it has acted as a poison. In many cases where poisoning has resulted the plants were quite old and probably in the incipient stages of decay. However, it is claimed that a poisonous principle, called *helvellic acid,* has been isolated by a certain chemist, which acts as a violent poison. This principle is very soluble in hot water, and when care is used to drain off first water in which they have been cooked, squeezing the water well from the plants, they are pronounced harmless. The safer way would be to avoid such suspicious species." Another author may be quoted. McIlvaine (One Thousand Am. Fun., p. 547) says: "Since 1882 myself and friends have repeatedly eaten it. In no instance was the slightest discomfort felt from it. It was always enjoyed. Mr. Charles H. Allen, San Jose, Cal., writes to me that G. esculenta grows plentifully in his region, and that it is not only edible, but he has found it one of the best. But the species, though long ago esteemed highly in Europe and by many in America, now rests under decided suspicion. . . . . The species would be better let alone." Dr. Fischer says "it undoubtedly—though rarely—causes symptoms of poisoning in the United States."

Fig. 99. Gy-ro-mi'-tra es-cu-len'-ta. Hel-vel'-la or Gy-ro-mi'-tra. Edible. Photo by Dr. O. E. Fischer, Detroit, Mich. The plants are represented less than life size. For comments see paragraph above.

FIG. 100. TRI-CHO-LO'-MA MEL-A-LEU'-CUM. This *Tri-cho-lo'-ma* was found in great abundance in the woods of Cedar Point, near Sandusky, Ohio, first brought to the laboratory by H. H. York. The size and general character of this white-spored Agaric are fully shown in the illustrations. It was found in sandy soil, growing singly in the shady woods. The color is usually pale, nearly white at first, later much darker, but hardly sooty. Photograph from specimen collected near Sandusky, Ohio, August 1904. This represents the same Mushroom as shown in Fig. 96. All the plants shown in Fig 96 are rather young; the same is true of those shown in Fig. 100 except the one to the left. Here the cap is flattened out and ultimately curved upward.

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# MYCOLOGICAL BULLETIN
## No. 32

*W. A. Kellerman, Ph. D., Ohio State University*

*Columbus, Ohio, April* 15, 1905

A Po-ly'-po-rus Number.—Though the fungi belonging to the *Pol-y'-po-ra'-ce-ae*, or Pore-fungi, are not so important to the mycophagist as some other groups they are just as interesting to the student and lover of Nature. When very young some of the species are edible and used to a considerable extent. They soon become tough or hard and leathery, most of the conspicuous forms being woody in consistency. Some of the common forms will be shown in this and succeeding Numbers of the Bulletin.

Classification.—These fungi are near relatives of the Ag'arics or the Gill-fungi, inasmuch as the spores are borne on enlarged cells, called *ba-sid'-i-a*. Each ba-sid'-i-um bears at its apex a few (commonly two or four) spores at the tips of little stalks. The name of this slender stem or stalk is, in botanical language, *ster-ig'-ma;* the plural is *ster-ig'-ma-ta*. All fungi that produce ba-sid'-i-a and basidiospores constitute the group of *Ba-sid-i-o-my-ce'-tes*. Again, those fungi that bear the spores within a cell, which is called an *as'-cus*, form the group of *As-co-my-ce'-tes*. The common and conspicuous Mushrooms are members of these groups and are spoken of sometimes as the *true fungi*, or expressed in technical language, *Eu-my-ce'-tes*. The Grape Mildew, the Black Mould or Mucor, etc., are quite different in some of their characters, particularly in their mode of spore production; in fact they are in this respect, like some Algae and hence have been called *algal-fungi*. For this group the botanical name, which has this signification, is *Phy-co-my-ce'-tes*. At the risk of offending the gentle reader with a prolix classification, it may be said that these groups of plants, *i. e.*, the Fungi, may be set opposite the Al'-gae (the latter plants being simple in structure like the fungi, but unlike them in having *chlo'-ro-phyll*, or "leaf-green")—the two groups constituting what the botanists call Thal'-lus plants or *Thal'-lo-phytes*.

Fig. 101. Po-ly'-po-rus ar-cu-i-a-ri-for'-mis. This polypore was recently described as a new species by William A. Murrill, in the October Number of Torreya (1904). It was collected at Unaka Springs, East Tennessee. The upper side is shown in Fig 1, the under side in Fig. 2, magnified 2⅔ times. A small portion of the upper surface is shown at 3, and a small portion of the lower surface is shown at 4, both magnified 8 times. Professor Murrill has kindly loaned us the electro for reproducing the figure of this interesting species.

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## MYCOLOGICAL GLOSSARY.

*Pilif'erous:* covered with soft hairs.
*Placen'tiform:* shape of a circular disk depressed above and below in the middle.
*Plasmo'dium:* the motile protoplasmic mass representing the vegetative stage of the slime-moulds.
*Pli'cate:* folded like a fan.
*Plum'beous:* lead-color, bluish-gray.
*Poculiform:* cup-shaped.
*Pore:* in the Pyrenomycetes same as ostiole or ostiolum.
*Porrect:* stretched horizontally.
*Posterior:* in case of the gills of the Agarics, denotes the point next to the stem; that is, the posterior end is that next to the stipe.
*Pro'toplasm:* the living nitrogenous mass of the cell which is the physical basis of life.
*Pubes'cent:* with short hairs.
*Pul'vinate:* cushion-shaped.
*Punctate:* dotted.
*Pus'tular:* with elevations like blisters or pustules.
*Putres'cent:* soon decaying.
*Pycnidial spores:* sporules, or the 'spores' (not ascospores) found in pycnidia.
*Pycnidium* (pl. *pycnidia*): a perithecium-like ascocarp or body in which sporules are produced.
*Pyrenomyce'tes:* the Ascomycetes with enclosed or nearly enclosed hymenium.
*Recep'tacle:* the part of the sporophore that contains the spores.
*Remote':* said of gills that do not reach the stem.
*Re'pand:* wavy.
*Re'plicate:* folded back upon itself.
*Resu'pinate:* attached by the back, hence the hymenium facing outwards; in this case there is no stem to the fungus which is spread over the matrix; applied to the Polypori, etc.
*Re'volute:* rolled backward.
*Rhi'zomorphs:* the dark root-like mesh of mycelial cords often seen in rotten wood which represents the vegetative (perhaps resting) stage of Agarics, etc.
*Rhodospo'rae:* the pink or rosy spored Agarics.
*Ri'mose* or *rimous:* full of cracks.
*Ring:* the part of the partial-veil that adheres to the stem of an Agaric; annulus.
*Ros'trate:* beaked.
*Rubes'cent:* somewhat reddish in color.
*Rufes'cent:* of a dull red color, or becoming rufous.
*Ru'gose:* wrinkled.
*Sanguin'eous:* blood-colored.
*Sap'rophyte:* a fungus that draws its nourishment from dead vegetable or animal matter.
*Scab'rous:* with a rough surface.
*Scis'sile:* easily split; said of gills readily separable into two plates.
*Sclero'tium:* a hard black mass, sometimes resembling a tuber, which is the dormant or resting vegetative stage of some fungi, and from which later sporophores may arise.
*Scorbic'ulate:* with small pits or furrows.
*Scu'tellate:* like a plate or platter.
*Se'pia:* deep dark reddish brown.
*Sep'tate:* having partitions.
*Sep'tum:* a partition.
*Seri'ceous:* silky.

[TO BE CONTINUED.]

Explaining similarly the basis of classification and arrangement of the other plants, we would have the Mosses and Liverworts forming the group *Bry'-o-phytes;* the Ferns, Scouring Rushes and Ground Pines forming the *Pter-id'-o-phytes;* and finally the Pines and common higher plants as Sage, Rose, Oak, Dandelion, etc., forming the *Sper-mat'-o-phytes.* Putting this all in the form of a diagram or synoptical tabulation we would have it presented to the eye thus:

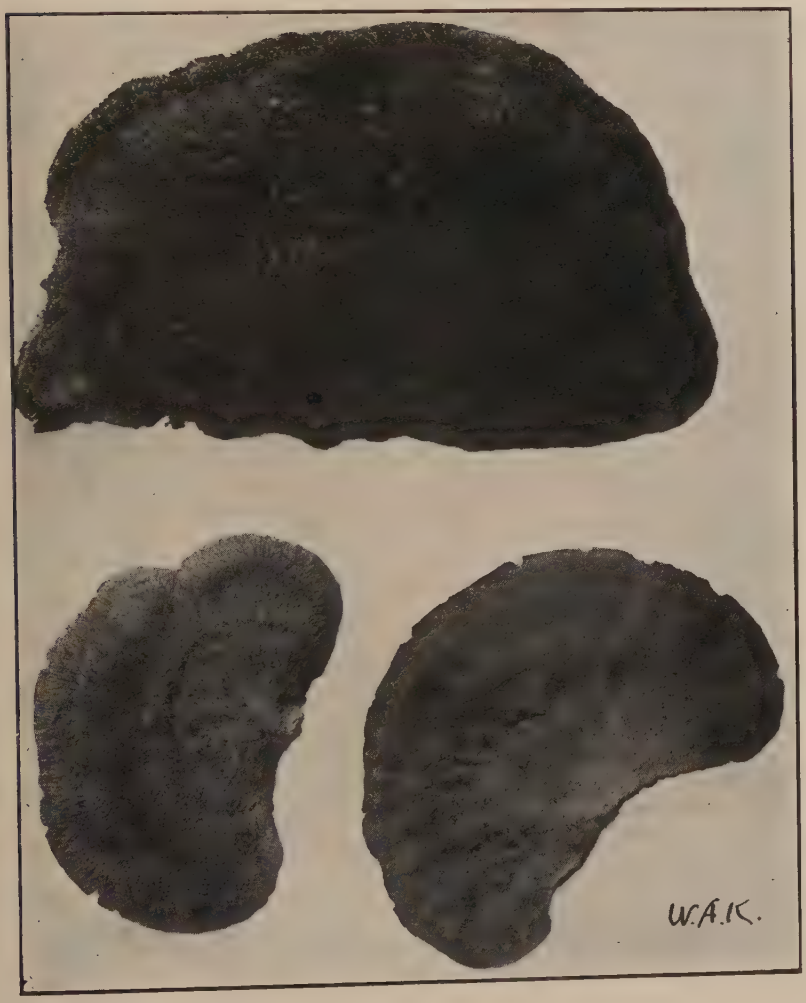


FIG. 102. PO-LY'-PO-RUS HYD-NOI'-DES. A Polypore from Central America, very striking by reason of its black color and covering of long bristles or scale-like hairs above. The underside is shown in the lower specimen on the right, and a small portion of this magnified is shown in FIG. 103. The plants were collected the past winter from old railroad ties, near Port Barrios, Guatemala.

PLANTS
- SPER-MAT'-O-PHYTES, or the common higher plants, as the herbs, shrubs and trees.
- PTER-ID'-O-PHYTES, or the Ferns, Scouring Rushes, and Lycopods or Ground Pines.
- BRY'-O-PHYTES, or the Mosses and Liverworts.
- THAL'-LO-PHYTES
  - Fungi — *Ba-sid'-i-o-my-ce'-tes*, *As'-co-my-ce'-tes*, *Phy'-co-my-ce'-tes*
  - Algae

ORDERS COMPRISING THE BA-SID'-I-O-MY-CE'-TES.—If we carry this matter of tabulation a little further we will have the following scheme:

BA-SID'-I-O-MY-CE'-TES
- NID-U-LAR-I-A'-LES, the Bird's-nest Fungi.
- LY-CO-PER-DA'-LES, the Puff-balls.
- PHAL-LA'-LES, the Phalloids or Stinkhorns.
- A-GAR-I-CA'-LES, Mushrooms and related Fungi.
- TRE-MEL-LA'-LES, the gelatinous Fungi.
- AU-RIC-U-LAR-I-A'-LES, the Jew's ear, etc.
- U-RE-DIN-A'-LES, the Rusts.
- US-TI-LA-GIN-A'-LES, the Smuts.

FIG. 103. The PORES or portion of the hymenial layer of PO-LY'-PO-RUS HYD-NOI'-DES. The microphotograph was made by using a 2-inch ocular and a 3-inch objective. The fungus is shown natural size in Fig. 102, where further explanation may be found.

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# MYCOLOGICAL BULLETIN
## No. 33

*W. A. Kellerman, Ph. D., Ohio State University*
*Columbus, Ohio, May* 1, 1905

ACKNOWLEDGMENT.—We have to thank Mr. Fred J. Seaver for the instructive illustration contained in Fig. 106, and Professor McBride, of the University of Iowa, for the use of the electro. This and many others were used in Volume 5 of the Bulletin from the Laboratories of Natural History of the State of Iowa, and we will take occasion to reproduce one or two more illustrations from this series in future Nos. of the BULLETIN.

AN INTERESTING ILLUSTRATED ARTICLE.—It is a pleasure to call attention to Mr. Seaver's article on the Discomycetes of Eastern Iowa which is fully illustrated—twenty-five plates being used, each illucidating two species. Our Fig. 106 is a sample. The plant, natural size usually, is given, then enlarged figures—these always showing an ascus and paraphyses if any, also the spo-rid'-i-a or ascospores.

FIG. 106. The following is the explanation for the plate marked Fig. 106, p. 132: The illustrations marked I, *a*, *b*, and *c*, show SPATH-U-LA'-RI-A CLA-VA'-TA. At *a* three plants are represented natural size, and in their natural habit. At *b* is given a figure of a single ascus containing spores, accompanied by two branching pa-raph'-y-ses; these are magnified 1000 diameters. Fig II, *a*, *b*, *c*, exhibits LE-O'-TI-A STI-PI-TA'-TA. At *a* three plants are given natural size; at *b* a mature ascus with spores and two pa-raph'-y-ses magnified 750 diameters are shown. Fig. *c* exhibits a single spo-rid'-i-um, or ascospore, magnified 2000 diameters. The figures are all drawn by Fred J. Seaver from specimens collected in Iowa. SPATH-U-LA'-RI-A CLA-VA'-TA is a common yellow species occurring in woods in summer. LE-O'-TI-A STI-PI-TA'-TA has a globose or spreading pileus of dark aeruginous green, the stem is a light yellow. It occurs in woods in summer and fall.

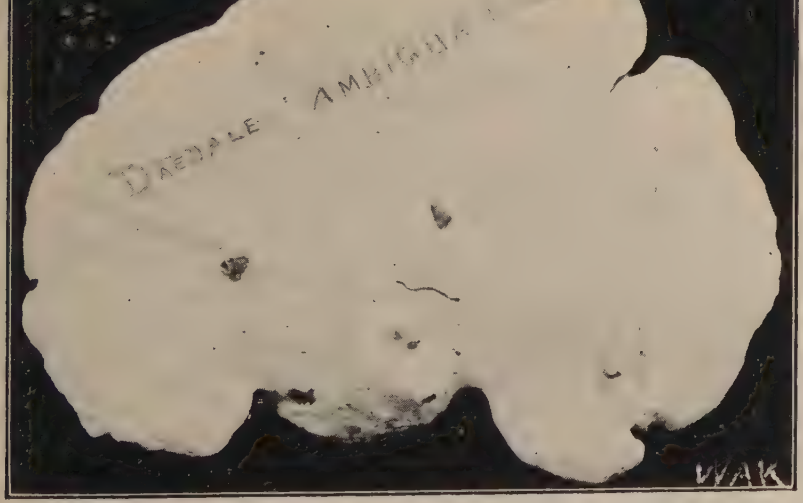

FIG. 104. DAE-DA'-LE-A AM-BIG'-U-A. This represents, considerably reduced from the natural size, a common fungus in habit much like the common Polypores; but the pores are changed slightly from this circular shape, as in this case, or they become much flattened so as to form labyrinthine passages, or even lamellae or plates. A magnified view of the pores is shown in the next figure. The photos are from a herbarium specimen that was distributed by the Alabama Biological Survey, collected by F. S. Earle in 1898.

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## MYCOLOGICAL GLOSSARY.

*Serrate:* margin with saw-like teeth.
*Ser'rulate:* minutely serrate.
*Ses'sile:* attached directly to the base; without stem.
*Se'ta:* a bristle or stiff hair.
*Seta'ceous, seti'gerous,* or *se'tose:* bristly.
*Set'ulose:* finely setaceous.
*Sig'moid:* S-shaped.
*Sinuate, sinuose, sinuous:* waved or serpentine.
*Si'nus:* the curve between two lobes.
*Smooth:* destitute of hairs (not necessarily an even surface).
*Sordid:* of a dirty dingy hue.
*Spadic'eous:* date-brown, *i. e.*, a dull dark brown.
*Spath'ulate:* shaped like a spathula or spoon.
*Spat'ulate:* shaped like a spatula or spoon.
*Species:* a group of individuals that are alike or of one kind.
*Spic'ule:* a minute point or slender granule.
*Spin'ule:* a small spine or slender prickle.
*Spore:* the minute simple reproductive body of the Mushrooms and other plants similar in function to the seed or complex structure of the common plants. The terms spore, sporule, sporidium, conidium, etc., are often used indiscriminately.
*Spo'rocarp:* the fruiting portion (not the vegetative part) of the Ascomycetes.
*Sporid'ium: see spore.*
*Spo'rophore:* the hypha or other part that bears spores.
*Sporule: see spore.*
*Squa'ma:* a scale.
*Squa'mose, squa'mous:* scale-like or with scales.
*Squa'mula:* a little scale.
*Squamulose, squamulous:* with small scales or squamae.
*Squar'rose:* rough with scales or projecting points.
*Sterig'ma* (pl. *sterig'mata*): a little stalk on a basidium bearing the spore.
*Stipe:* the stem of a mushroom.
*Sti'pitate:* with a stipe, or stem.
*Sto'ma* (pl. *stomata*): an opening or mouth.
*Straight:* a term applied to the edge of a pileus when not involute.
*Strami'neous:* of straw or straw-color.
*Stra'tose:* in distinct strata or layers.
*Stri'ate:* marked with parallel lines, or *striae.*
*Strobil'oform:* like a pine cone.
*Stro'ma* (pl. *stro'mata*): a compact mycelium on or in which perithecia or other organs of fructification are produced.
*Stuffed:* said of a mushroom stem if filled within by material of a texture different from that of the wall.
*Sub-gleba:* the basal portion of the gleba.
*Subic'ulum:* a layer of hyphae covering the matrix and over which is the hymenium.
*Substra'tum:* the matrix, or that on which the mushroom grows.
*Sul'cate:* with furrows or grooves.
*Superior:* said of the ring or annulus when near upper end of stem.
*Symbio'sis:* living together of two organisms in mutual dependence.
*Teleu'tospore:* the thick-walled winter spore, or end-spore in a series of the life-cycle of polymorphic forms, for example, the winter spores of the Rusts.
*Tes'selated:* checkered in a regular manner.
*Testa'ceous:* brick-red.
*Thal'lophyte:* one of the lower plants whose body is a *Thallus* (not differentiated into stem, leaf, etc.).

[TO BE CONTINUED.]

Classification of the A-gar-i-ca'-les.—This order includes several families of the most interesting and the most conspicuous Mushrooms. The *hy-me'-ni-um* or spore-bearing layer is a smooth layer in the Hypoch-na'-ce-ae, The-leph-o-ra'-ce-ae and Cla-var-i-a'-ce-ae; in the Hyd'-na-ce-ae there are dependent spine-like processes on whose surface the ba-sid'-i-a are borne; in the Po-ly-po-ra'-ce-ae the *hy-me'-ni-um* consists of pores, the same also in the Bo-le-ta'-ce-ae, but here the layer of pores is separable from the pileus; and in the A-gar-i-ca'-ce-ae there are gills or lamellae to support the hy-me'-ni-um. The tabular synopsis would be as follows:

Order A-GAR-I-CA'-LES
- Family A-gar-i-ca'-ce-ae
- Family Bo-le-ta'-ce-ae
- Family Hyd-na'-ce-ae
- Fmaliy Po-ly-po-ra'-ce-ae
- Family Cla-var-i-a'-ce-ae
- Family The-leph-o-ra'-ce-ae
- Family Hy-poch-na'-ce-ae

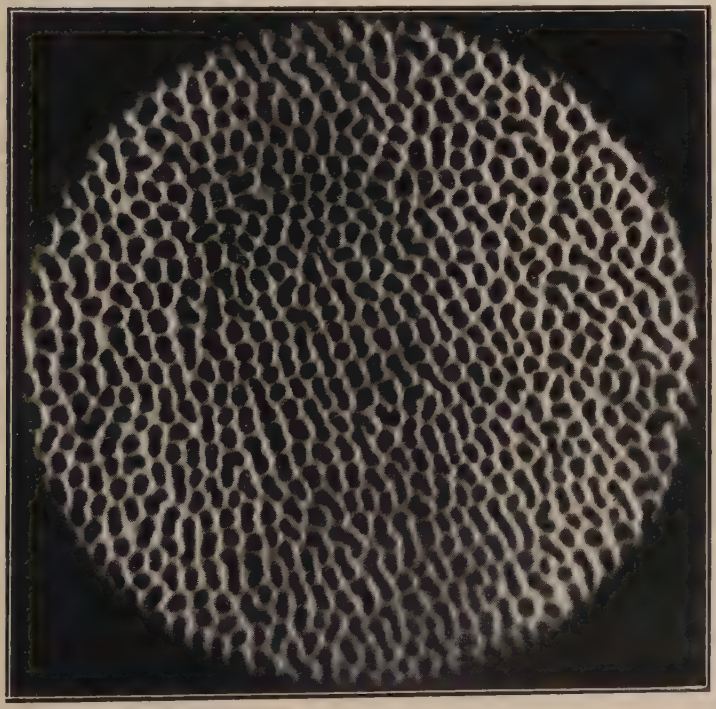

Fig. 105. Dae-da'-le-a am-big'-u-a. The pores magnified of the same plant shown in Fig. 104. The microphotograph was made by using a 2-inch ocular and a 3-inch objective. See explanation of Fig. 104.

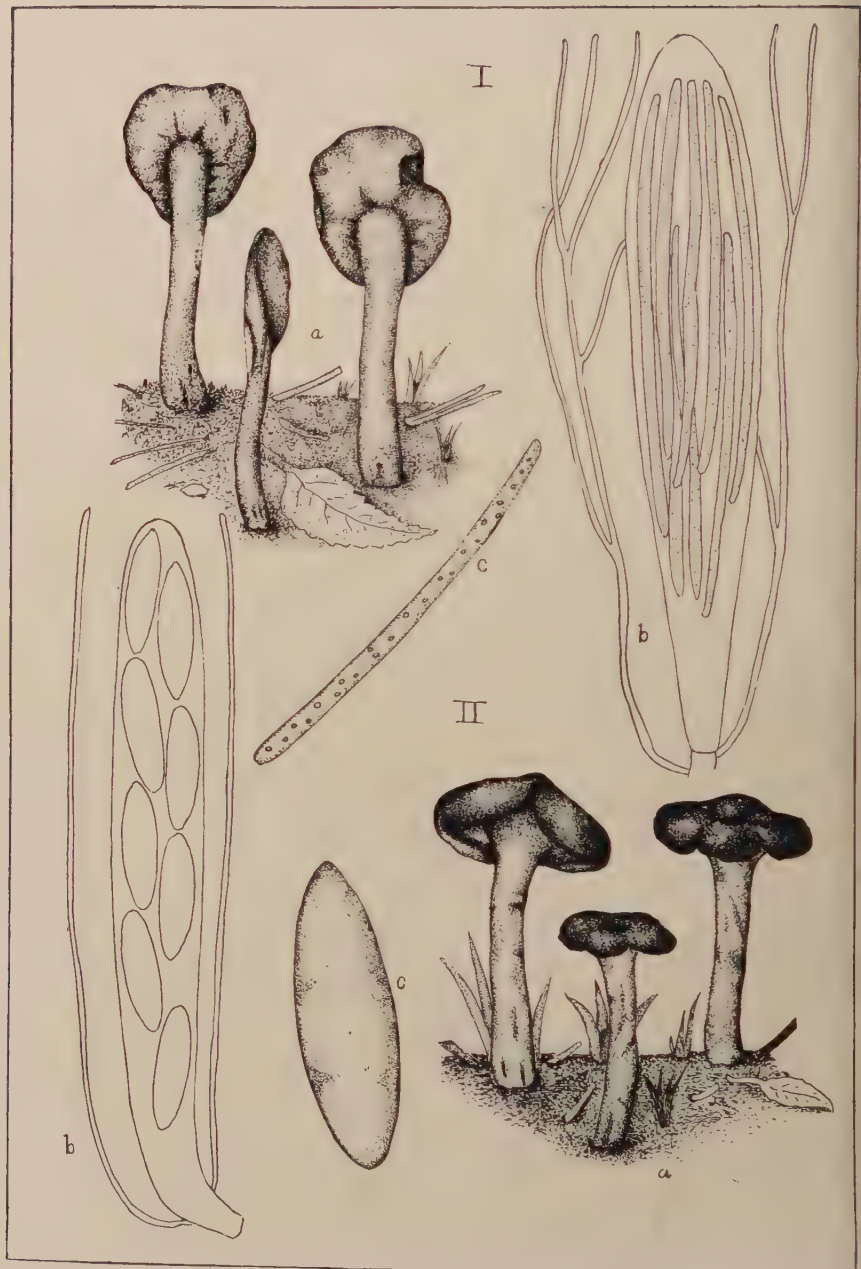


FIG. 106. SPATH-U-LA'-RI-A CLA-VA'-TA (I) and LE-O'-TI-A STI-PI-TA'-TA (II), by Fred. J. Seaver. See explanation on page 129.

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# MYCOLOGICAL BULLETIN
## No. 34

*W. A. Kellerman, Ph. D., Ohio State University*

*Columbus, Ohio, May 15, 1905*

ACKNOWLEDGMENTS.—The artists who contributed the photos and drawings for the accompanying figures are Dr. O. E. Fischer, of Detroit, and Mr. Fred J. Seaver, of the Iowa State University. Thanks are extended and the example commended.

EXPLANATION OF FIG. 109.—A plant of MOR-CHEL'-LA CON'-I-CA is shown at I, natural size: *b*, at the left, is a section showing the pits; at *c* an ascus with ascospores accompanied by one pa-raph'-y-sis, x 500; at *d* a sporidium, x 750, is figured. In II a specimen, natural size, of MOR-CHEL'-LA HY'-BRI-DA is given; a section to show the free pileus and pits is given at *b*; at *c* a mature spore-bearing ascus with a pa-raph'-y-sis, x 400; *d* is a single sporidium, x 800. Drawings by Fred J. Seaver.

VOL-VA'-RI-A.—A common species illustrated below. The name of this genus will be evident at once, namely the *vol'-va* bearing fungus. The plants belong to the *rosy-spored* Ag'arics. While the volva is present the an'-nu-lus, or ring, is absent, and the latter character separates the species from that of AM-A-NI'-TA. The stem is easily separable at its junction with the pileus, the same being true of its near relatives, namely, *Am-a-ni'-ta, A-man-i-top'-sis,* and *Lep-i-o'-ta.*

FIG. 107. VOL-VA'-RI-A BOM-BY'-CI-NA. Edible. Said to be of world-wide distribution, but not common; found on decayed logs, stumps, etc., during late summer and autumn. From photo by Dr. O. E. Fischer, Detroit, Michigan.

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## MYCOLOGICAL GLOSSARY.

*Toad'stool:* any one of the common conspicuous fungi; same as Mushroom; may be poisonous or non-poisonous, edible or inedible.
*To'rose:* swollen at intervals.
*Tra'ma:* the interior portion of the gills or pileus.
*Tremel'loid:* gelatinous or stiff jelly-like, as a *Tremella.*
*Tu'mid:* slightly swollen.
*Umbil'icate:* with a rounded pit or central depression.
*Um'bo:* central elevation as on the cap of some Mushrooms.
*Um'bonate:* with an umbo.
*Unequal:* applied to gills of unequal length.
*Universal veil:* a volva which entirely envelopes the plant when young.
*Ure'do:* the second stage in the life cycle of rusts; red Rust.
*Ure'dospore:* a thin-walled summer spore produced by the *Uredo,* or stage of the group of Rusts preceding the teleutospore-bearing.
*Vaginate:* having a sheath.
*Veil:* a covering of a part or all of the fungus; see *Partial Veil, Universal veil.*
*Ven'tricose:* swollen in the middle.
*Ver'nicose:* appearing as if varnished.
*Ver'rucose:* coveerd with warts or small elevations.
*Verru'ciform:* same as verrucose.
*Ves'icle:* a bladder-like cavaity, or a cell.
*Vesicular, vesiculose:* full of rounded cavities or vescicles.
*Vol'va:* a wrapper or envelope which at first covers the entire young plant; a universal veil; it may remain as a cup at the base of the Mushroom, or be broken up in fragments distributed over the cap and base of stem.
*Zonate:* marked with zones or concentric bands of color.

FIG. 108. PLU'-TE-US CER-VI'-NUS. Edible. Photo by Dr. O. E. Fischer, Detroit, Michigan. Previous figure of this species on p. 64, and explanation on p. 62.

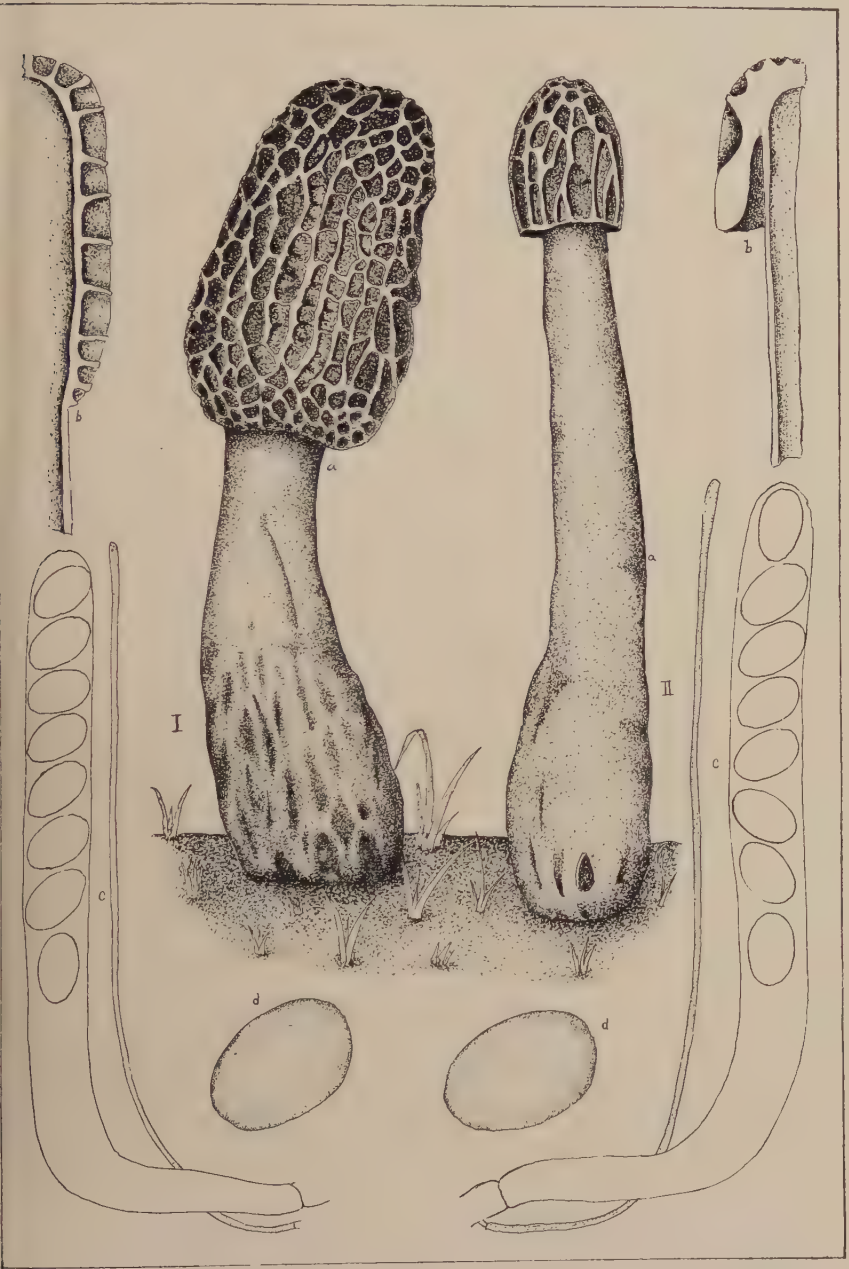


FIG. 109. MOR-CHEL'-LA CON'-I-CA AND MOR-CHEL'-LA HY'-BRI-DA. By Fred. J. Seaver. See p. 133 for explanation.

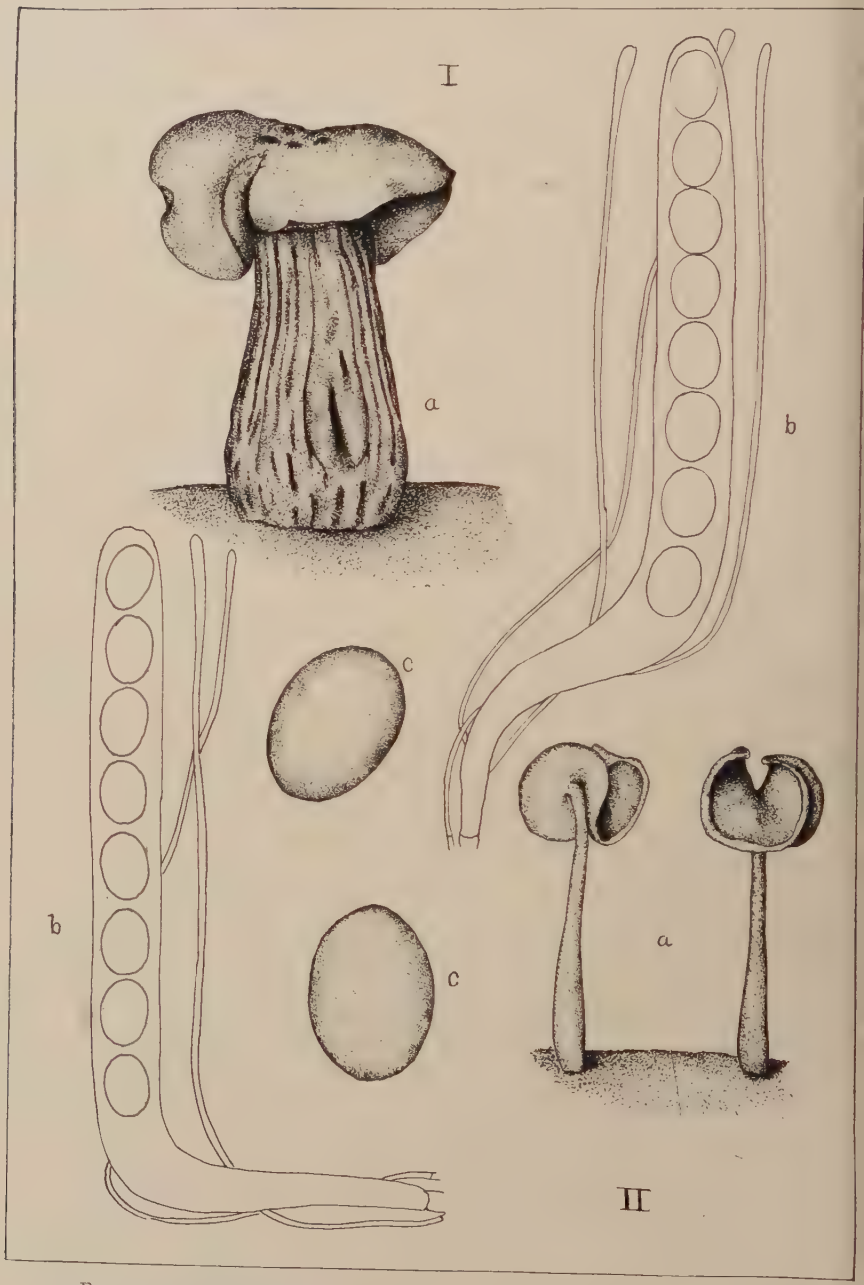


FIG. 110. HEL-VEL'-LA CRIS'-PA AND HEL-VEL'-LA E-LAS'-TI-CA. By Fred J. Seaver. See p. 137 for explanation.

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# MYCOLOGICAL BULLETIN

## No. 35

*W. A. Kellerman, Ph. D., Ohio State University*

*Columbus, Ohio, June* 1, 1905

EXPLANATION OF FIG. 110. The following are shown: HEL-VEL'-LA CRIS'-PA, one plant, natural size, at I *a*; an ascus and three pa-raph'-y-ses are shown in *b*, x 600; *c* is a sporidium, x 1400. In II *a* is shown a plant, natural size, of HEL-VEL'-LA E-LAS'-TI-CA; at *b* are two pa-raph'-y-ses accompanying the mature ascus; at *c* a single sporidium is given, x 1200. All figures drawn by Fred J. Seaver, Iowa State University.

TERMS ILLUSTRATED IN THE PLATE.—The following mycological terms are illustrated on the accompanying plate:

*Adnate, Agaric, Annulus, Ascospores, Ascus,*
*Basidiospores, Basidium,*
*Cap, Capillitium, Cell, Conidiophores, Cystidium,*
*Decurrent,*
*Gills,*
*Hymenium, Hyphae,*
*Involute,*
*Lamella,*
*Mushroom,*
*Plasmodium, Protoplasm,*
*Revolute, Ring,*
*Sinuate, Spore, Sterigma, Superior,*
*Toadstool, Trama,*
*Umbilicate, Umbo, Umbonate,*
*Vesciculose, Volva.*

FIG. 111. VOL-VA'-RI-A PU-SIL'-LA. The illustration was made from a photo sent by Dr. O. E. Fisher; the plants are represented very slightly enlarged; they were collected early this spring, at Detroit, Michigan.

University Bulletin, Series 9, No. 21. Entered as Second Class Matter, Post-office at Columbus, Ohio

A Plate to Illustrate the Slime Moulds.—A portion of a *plasmodium* highly magnified, and a single species more or less magnified of each of the common genera of *Myxomycetes* or Slime Moulds, are given. These are diagrammatic figures mostly adapted from plates in Macbride's North American Slime Moulds.

Fig. 112. Col-lyb'-i-a rad-i-ca'-ta. A sketch showing abnormal growth of this common edible Col-lyb'-i-a; the specimens were found on a rotten log, but the "root" was unable to peretrate the hard, less-rotten portions. In one case the "root" portion was not at all developed, as shown in the middle specimen, but a more energetic plant (sketch to the left) turned its course at right angles and grew to the usual length. A distorted cap is shown in the plant sketched at the right. These were collected near Sandusky, Ohio, last year.

The Glossary as a Separate Pamphlet.—It has been decided to reprint the Mycological Glossary which has appeared on successive pages in this Bulletin. A serviceable paper will be used—and the expense involved in this matter requires that the price per copy be placed at 25 cents. Beginners, amateurs, and students of Mushrooms will doubtless find this little dictionary of some advantage.

Fig. 113. Illustrations of Mycological Terms.

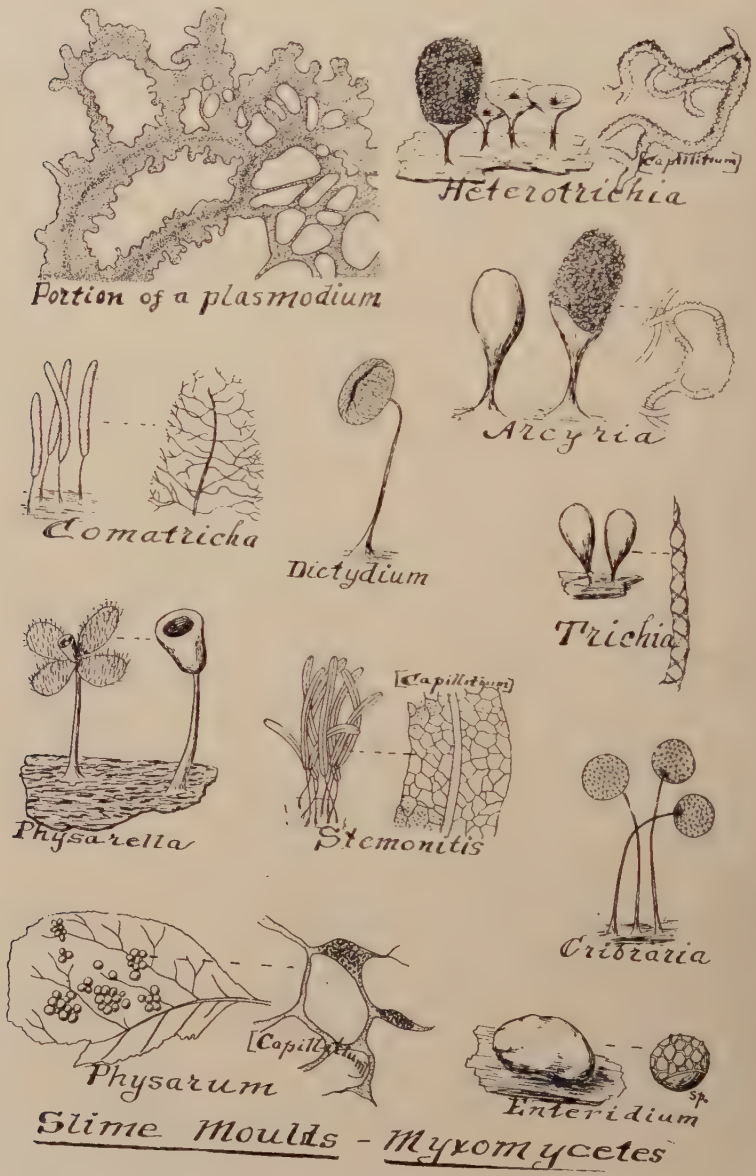


FIG. 114. ILLUSTRATIONS OF THE SLIME MOULDS.

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# MYCOLOGICAL BULLETIN

## No. 36

*W. A. Kellerman, Ph. D., Ohio State University*

*Columbus, Ohio, June 15, 1905*

THE ILLUSTRATIONS IN THIS NUMBER.—We have to thank Dr. O. E. Fischer for the photo of the elegant Peziza shown in Fig. 115. The etching in Fig 116 represents a saprophytic species of fungus found on old stems of the prickly lettuce. A common and abundant fungus, Cli-toc'-y-be mul'-ti-ceps, is shown in Figure 117. On the last page we give an illustration of Pho-li-o'-ta u-nic'-o-lor, also found near Columbus, a species perhaps not rare in this country.

THE GROUP NAMES.—Since plants are almost infinitely numerous one can readily see the necessity of grouping or classifying them, and therefore *names* of groups are a necessary evil, or rather a scientific necessity. Neither is it simply for convenience that botanists establish groups with appropriate names, but the verity of the groups and their proper arrangement exhibit plant affinities; and only by discerning these genetic relationships can we have any proper idea of the evolution of the plant kingdom, or conception of the unity and order in Nature that modern science has elucidated. A casual notice will show that there has been "order in this madness," for all the Ordinal names end with the syllables *a'-les*. In the next No. of the BULLETIN the Families constituting the Order *A-gar-i-ca'-les* will be given, and then it will be seen that the terminal syllables *ce-ae* suggest a family name. *Po-ly-po-ra'-ce-ae* is a case in point.

THE PEZIZAS AGAIN.—Some illustrations of these Cup-fungi have already been given; for example, Pe-zi'-za re-tic-u-la'-ta was shown in Figs. 20 and 21 (pp. 14 and 15); Sar-co-scy'-pha oc-ci-den-ta'-le and Sar-co-scy'-pha floc-co'-sa were illustrated in Figs. 36 and 37 (pp. 30 and 31); Bul-ga'-ri-a in-qui'-nans was given in Fig. 44 (p. 40); and Pe-zi'-za ba'-di-a in Fig. 61 (p. 66). These and related forms are readily referable to the family Pe-zi-za'-ce-ae. They are charming fungi—some of them extremely delicate, tiny and handsomely colored.

PE-ZI'-ZA, A LARGE GENUS.—As the earlier botanists used this generic term it included a very large number of species. In later times other genera have been carved out of it or formed to include special groups of

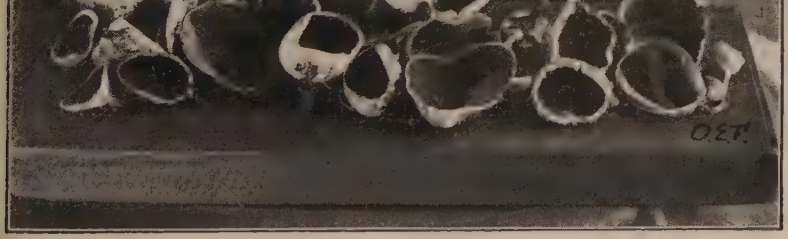


FIG. 115. PE-ZI'-ZA COC-CIN'-E-A (*Sar-co-scy'-pha coc-cin'-e-a*). Scarlet Pe-zi'-za. This beautiful plant appears very early in spring. It may be found in the woods growing on rotten logs or on decayed wood in the soil. The photo from which the cut was made was furnished by Dr. O. E. Fischer, Detroit, Michigan.

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the species; thus we have Geophyxis, Acetabula, Otidia, Discina, Pyroneana, Humaria, Sarcoscypha, Lachnea and many others—and enough species left over to give Peziza a respectable standing as a genus.

The Name Pe-zi'-za.—This was given by Dillenius in 1819, taken from the Greek word, *Pezis*, used to designate "a mushroom without a stalk." Some botanists, seized with a zeal for pure classical terminology, say this ought to be therefore *"Pe'-zis,"* not "Pe-zi'-za." I am not competent to judge in the case, but at any rate this may be said, that *Pe-zi'-za* (*not "Pezis"*) was really the name given by Dillenius in 1819 and a good-enough name withal. Besides if this is to be changed to suit refined taste, then I suppose dozens if not hundreds of others may be drawn into the same category. Mycologists today are coining such names as Rehmiomyces, Eichleriella, Prachtflorella, and they seem to serve the purpose even if they are not classical Latin. The oldest name, that is, the first name given, illy or happily chosen, is the one to be used invariably, a rule which botanists call the *Principle of Priority*. A strict application of this perhaps will give, if anything will give it, stability in nomenclature, devoutly to be wished.

The Group of Dis'-co-my-ce'-tes.—The Pezizas serve well to illustrate the large group called Dis'-co-my-ce'-tes. These fungi have the spores in *as'-ci;* and the *hy-me'-ni-um,* or spore-bearing layer, forms the surface layer or bottom mostly of a *cup or saucer-shaped fruiting body*. The Helvellas, Gyromitra, Bulgaria, as well as Peziza, heretofore illustrated, belong to this group.

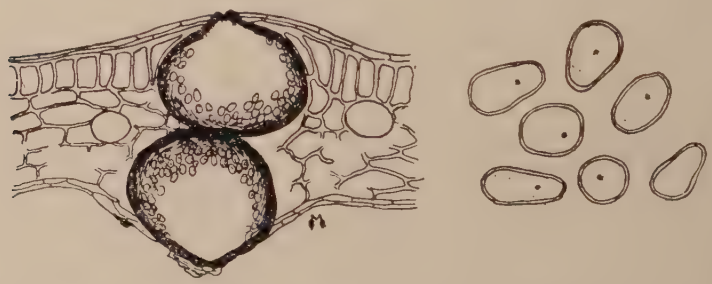

Fig. 116. Phy-lo-stic'-ta a-sim'-i-nae. A Leaf-spot Fungus of the Papaw. The figure shows a section through the leaf moderately magnified and at the right the spores (sporules) highly magnified. The spore-case is called the *pyc-nid'-i-um*, and this is formed, as shown in the figure, below the epidermis, though it is slightly erumpent when mature. Many of the pyc-nid'-i-a are clustered in a single dead spot on the leaf which may be of circular or irregular outline; the pycnidia can be easily seen with a hand lens—sometimes even distinctly by the unaided eye. This is a parasitic species and the dead tissue of the leaf is caused by the presence of the fungus.

Interesting Common Names.—To some of the conspicuous Pezizas fanciful names have been applied, and it will be interesting to put them on record. It is said for example that they are called "Blood-cups," "Fairy cups," "Flaps," "Bird's-nests," etc. The local names, if reported from various localities, will be listed; notice of special names in use of any or all kinds of Mushrooms is solicited.

FIG. 117. CLI-TOC'-Y-BE MUL'TI-CEPS. Edible. *Multiceps* means "many-headed"—and this species like some other Clitocybes is caespitose, that is to say, tufted or with many stems crowded together. The plants are found in great abundance in a partially cleared woods near Columbus. It flourishes from the middle of the season till late in autumn.

FIG. 118. PHO-LI-O'-TA U-NIC'-O-LOR. A common fungus growing on decayed wood. The plants are more or less clustered, bay, bay brown, or buff color, having ochraceous spores. This is not known to be edible, in fact we may look upon many Pholiotas with suspicion. MacIlvaine remarks, however, as follows: "Stevenson notes in his description of the genus: 'None are to be commended as edible.' My investigation shows that there are several delicious species, notably P. squarrosa and subquarrosa. Their lateness and plentifulness make them valuable food fungi. I have nothing but praise for the entire genus." The plants from which the photograph was taken occurred in a woods near Columbus, first brought in by H. H. York, in June.

IT BECOMES NECESSARY to call attention to the fact that Vol. I of the MYCOLOGICAL BULLETIN is exhausted. It is hoped that the set of Nos. (1-12) comprising Vol. I may be bought back from those who were but are not now subscribers. Any or all these Nos. are solicited—and perhaps present subscribers may be able in some cases to assist the editor in recovering the same, which would be a great accommodation to several parties.

**The Mycological Bulletin is issued on the 1st and 15th of each Month, Price 25c. Copies of Vol. II (1904) may be had for 50 cents each, or cloth bound copies for 75 cents. No copies remain of Vol. I (1903). Address, W. A. Kellerman Columbus Ohio.**

# MYCOLOGICAL BULLETIN

## No. 37

*W. A. Kellerman, Ph. D., Ohio State University*

*Columbus, Ohio, July* 1, 1905

HERE IS WHAT WE HAVE THIS TIME.—Professor Beardslee, of Asheville, N. C., has furnished an instructive article, accompanied with illustrative photographs, touching the common species of Cli-to-pi'-lus. We therefore devote this entire No. of the BULLETIN to this subject, and besides publish it in the Journal of Mycology.

## THE ROSY SPORED AGARICS OR RHODOSPORAE.

H. C. BEARDSLEE.

The Rosy Spored Agarics form an interesting group and one so favorable for study that it is proposed to give in successive Numbers of this Journal an outline of the group which shall help the beginner to recognize the common species. Care will be taken to point out the features by which the different groups can be recognized and figures of some of the more conspicuous and interesting species of each group will be given. The rarer species and those which are not well understood will not be considered.

### HOW TO RECOGNIZE THE RHODOSPORAE.

When a basket of fresh specimens has been collected, spore prints should first be secured by removing the caps from selected specimens and placing them on white paper. In a few hours, if the specimens collected are in a suitable condition, spores will have fallen in sufficient quantity so that the spore-colors will be plainly shown. All the specimens whose spores have a disinct red or flesh color may then be selected out. These

FIG. 119. CLI-TO-PI'-LUS NOV-E-BOR-A-CEN'-SIS. Photograph by H. C. Beardslee, Asheville, N. C.

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belong to the *Rosy Spored Agarics.* After a little practice many of this group can be recognized at first sight. The spores are often formed in profusion and give a pink tint to the gills, and often collect in masses on the gill and stem so that their color is readily seen.

### THE GENUS CLITOPILUS.

This genus has rosy spores and may be distinguished from other members of the group by its solid stem and its decurrent gills (*i. e.*, gills which run down on the stipe as described in an earlier Bulletin).

### KEY TO THE COMMON SPECIES OF CLITOPILUS.

The four common species may be distinguished by the following key:

Pileus white ..... 1
Pileus gray to brownish gray ..... 2

1. Pileus firm, dry, with a delicate white bloom.....*C. prunulus*
1. Pileus soft, slightly viscid .....*C. orcella*
2. Pileus thick, fleshy .....*C. abortivus*
2. Pileus thin, spores pale flesh color .....*C. noveboracensis*

### DESCRIPTIONS OF THE SPECIES.

CLITOPILUS NOVEBORACENSIS.—This species is abundant on the Asheville Plateau and may be found especially during wet weather. The pileus is dingy gray to pale gray in color, thin, with a distinct odor and a bitter unpleasant taste. The gills are crowded, pale, then dingy or yellowish. The stem is solid, pale gray, with an abundance of white mycelium.

It may be of value to add that this species is doubtless identical with *C. popinalis* of Europe. Specimens and photographs have been submitted to eminent European authorities and this opinion definitely verified. Bresadola also states in a recent publication that the latter species is also the same as the European *Clitocybe amarella.* I have preferred here, however, to use the common American name.

CLITOPILUS ABORTIVUS is one of our common species. It is usually found growing in colonies on the ground or on well rotted stumps and logs. It is 2-5 in. broad, gray to browninsh gray, not viscid, and is covered with a delicate tometum. The gills are pale gray, becoming rosy with the spores. The stem is solid and pale gray. Frequently clusters of plants are found which have not developed properly but have formed curious abortive masses from which the plant derives its name. The figure shows this peculiar feature well (Fig. 120). This species is edible, though not of the best quality.

CLITOPILUS PRUNULUS and CLITOPILUS ORCELLA are close relatives and resemble each other so closely that photographs of each do not need to be given. Both are white and have decurrent gills and may be easily recognized from the photograph

CLITOPILUS ORCELLA, as noted in the key, is slightly viscid, which is a convenient mark by which the species may be distinguished. Both are found in woods, especially along woodland roads. They are both edible species of excellent quality.

GY-RO-MI'-TRA ES-CU-LEN'-TA.—This belongs to the *Hel-vel'-la* Family which was briefly described on p. 15 and to this the reader may refer. In that connection (on p. 16) a half-tone illustration was given of *Gy-ro-mi'-tra brun'-ne-a,* a very common and interesting Mushroom which many regard as one among the best of the edible species. Through the kindness of Dr. Fischer, of Detroit, who were able to present another species of this genus, namely *Gy-ro-mi'-tra es-cu-len'-ta.* Its prominent characters have been stated as follows: It has a chestnut-red, irregularly rounded and lobed cap with brain-like convolutions. The margin of the cap is attached to the stem in two or three places. It is hollow within, and has a few prominent irregular ribs or ridges. The plant is two to four inches high, and the cap two or three inches broad; specimens have been found weighing a pound each. See Fig. 99, p. 123.

FIG. 120. CLI-TO-PI'-LUS A-BOR-TI'-VUS. The two lower plants show the fully developed form of the species; the upper figures are the common abortive form. Photographs by H. C. Beardslee, Asheville, N. C.

Fig. 121. Clit-o-pi'-lus or-cel'-la. Photograph by H. C. Beardsley, Asheville, N. C.

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# MYCOLOGICAL BULLETIN

## No. 38

*W. A. Kellerman, Ph. D., Ohio State University*

*Columbus, Ohio, July* 15, 1905

THE TWO-SPORED MOREL, MOR-CHEL'-LA BIS'-PO-RA. Not until now could I adequately report in print in reference to some curious little Morels sent from Wisconsin by Mr. A. F. Lane. They were collected the 16th of April, under an oak tree in a piece of mixed woods near Milwaukee. They were sent because of "their early appearance in the season," and because "they have characteristics not common to any of the other well-known Morels." A microscopic examination of the spores settled the identity of the species at once. Only *two spores* are contained in each ascus, whereas in the other species there are eight spores. They are therefore the botanical species known as Mor-chel'-la bis'-po-ra. The photographs made from the specimens are reproduced in Fig. 122.

FIG. 122. MOR-CHEL'-LA BIS'-PO-RA. TWO-SPORE MOREL. The plants are shown natural size; two of the figures are vertical sections, and the attachment of the cap at the apex of the stem only is more or less distinctly seen, but the hollow stem is less clearly shown in the engraving. The photographs were made from plants sent from Wisconsin by Mr. A. F. Lane.

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Previous Discussion and Illustration of the Morels.—These plants are very interesting and naturally we expect much to be said about them in the Bulletin. Turning back, we find that the subject has been reported in print or engravings on the following pages: 2, 5, 6, 7, 11, 13, 14, 21, 27, 129, and 135. All this with what has been added in this No. will doubtless satisfy the most exacting patron—until the Morelle season opens again next year.

The Genus Om-pha'-li-a.—These white spored Agarics are tersely described as follows by Professor Atkinson: "The Genus *Omphalia* is closely related to *Mycena* and *Collybia*. It differs from these mainly in the decurrent gills. In the small species of *Mycena*, where the gills are slightly decurrent, the pileus is not umbilicate as it is in the corresponding species of *Omphalia*. In some of the species of *Omphalia* the pileus is not umbilicate, but here the gills are plainly decurrent. The stem is cartilaginous."

The Species of Om-pha'-li-a.—There are between thirty-five and forty American species of this genus, some of them very common and abundant; they are usually small and occur mostly in the woods. One of the commonest and most widely distributed is Om-pha'-li-a cam-pa-nel'-la or Bell Omphalia. It may be found throughout the summer and autumn on rotten logs, stumps, etc., in shady moist woods. Its pileus is umbilicate, faintly striate and of a dull reddish color. The gills are narrow and connected by veins and decurrent on the stem. Another species is Om-pha'-li-a ep-i-chy'-si-um, distinguished by its smoky or dull gray color, the depressed or funnel-shaped pileus and short, slender stem. The species shown in this No. of the Bulletin is Om-pha'-li-a um-bel-lif'-er-a, whose characteristic cluster habit is amply illustrated in Fig. 125.

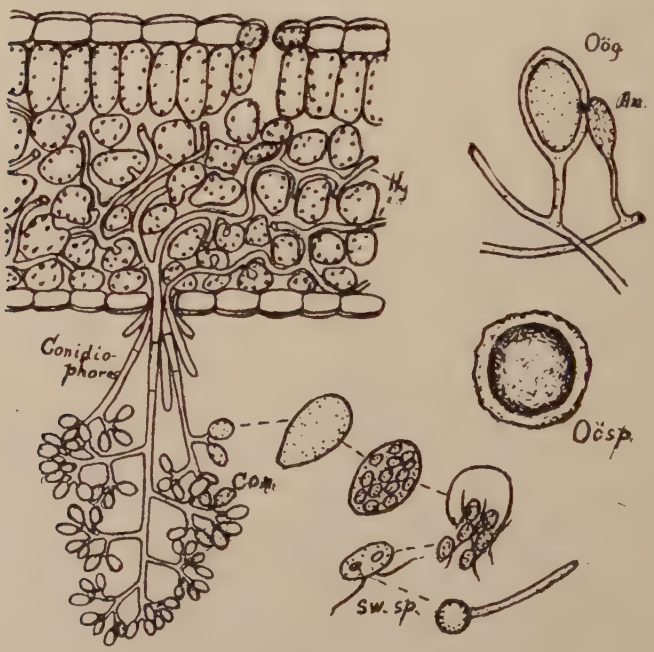


Fig. 123. Grape Mildew or Peronospora. See next page.

Are the Omphalias Edible?—For this phase of the subject we will quote a good author on mycophagy, McIlvaine, who says: "Raw, the writer has not found one that is objectionable in any way; a few have a woody taste. But two species have been found by him in sufficient quantity to make a dish. It is probable that all are edible.

Grape Mildew or Peronospora.—Again we interpolate a parasitic fungus that can not be called a Mushroom, but which nevertheless is very interesting both from the scientific and economic point of view. On the preceding page is given (Fig. 123) an etching which represents in a diagrammatic way, the well known enemy of the vineyards. The large figure to the left is intended to represent a magnified section through a grape leaf. The row of cells forming the protecting outer layer of the leaf above and below, is the epidermis. The cells between are full of protoplasm (not evident in the figure) and chlorophyll grains (leaf-green). Between these cells, and drawing nourishment from them, are the tube-like cells (called *hy-phae*) which form the body of the parasite. As seen it has developed upright (downright in this case) straight branching cells; all these are called *co-nid'-i-o-phores,* because they *bear* the *spores* which are called *co-nid'-i-a.* The latter are the summer spores; they germinate at once, infect other plants in the vineyard, and so multiply the parasite rapidly when climatic conditions are favorable. The remainder of the story must be told in a later No.

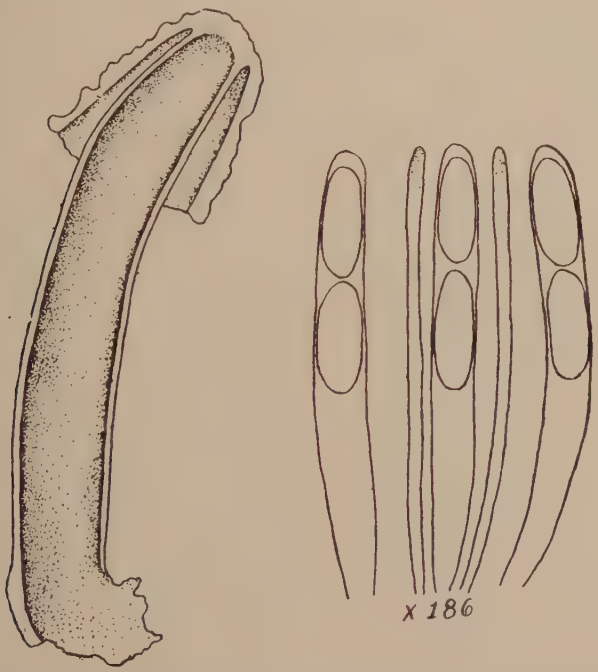


Fig. 124. Mor-chel'-la bis'-po-ra. Two-spore Morel. A vertical section through the middle of the plant shows the interior structure. It is seen that the stem is hollow and the cap attached only at its apex. The drawings to the right show the spore cases (*as'-ci*), each containing two spores, also slender cells accompanying the asci (which may perhaps be really immature or abortive asci), called the pa-raph'-y-ses. The plant is shown natural size, but the asci and spores are represented as magnified 186 diameters.

FIG. 125. OM-PHA'-LI-A UM-BEL-LIF'-ER-A. Umbellate Om-pha'-li-a. Growing on rotten wood in a moist, shady place near Columbus, O.

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# MYCOLOGICAL BULLETIN

## No. 39

*W. A. Kellerman, Ph. D., Ohio State University*
*Columbus, Ohio, August* 1, 1905

OM-PHA'-LI-A CAM-PA-NEL'-LA. BELL OM-PHA'-LI-A.—We have already commented briefly on Omphalias [see p. 150], quoting Atkinson's descrip-

FIG. 126. OM-PHA'-LI-A CAM-PA-NEL'-LA. BELL OM-PHA'-LI-A. See text.

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tion of the genus. Additional remarks were made concerning the species on the same page. Besides, a half-tone representing the Umbellate Ompha'-li-a was shown on p. 152. We give here an illustration of the common Om-pha'-li-a cam-pa-nel'-la, or Bell Omphalia—a charming little plant found on very rotten, wet logs in shady woods. It occurs throughout summer and autumn, often in enormous numbers spreading over an extended surface of its favorite matrix—a fallen, soggy, disintegrated log. The cap is convex and umbilicate, of dull reddish color or dirty white, having a watery appearance in damp weather.

LEP-I-O'-TA MOR-GAN'-I; MORGAN'S AGARIC.—This magnificent Mushroom was first collected by Professor Morgan; he sent it to Professor Peck, who named it as noted above. Though ordinarily placed in the white-spored section of the Agarics, it has pale *green* spores, as pointed out by its discoverer. The greenish spores and, when the plant is mature, the greenish gills in connection with its great size, readily identifies the species. The figures shown in this Number of the BULLETIN obviate the necessity of an extended description. It is pure white and often grows in huge fairy rings. It is a tempting subject for the amateur photographer. An additional illustration showing it in quantity in its natural habitat—especially as a fairy ring—is desired. The annulus is usually movable. As pointed out previously, the Lepiotas are botanically distinct from the Amanitas in not exhibiting a volva or sac at base of the stem.

It is shown in the two half-tones that the pileus is at first sub-globose or nearly globular; then it becomes expanded; in some old specimens it may be depressed. The usual size is six to eight inches high and five to nine inches broad.

IS LEPIOTA MORGANI POISONOUS?—McIlvaine says the only species of this genus known to be poisonous to some people is Lepiota morgani. Professor Stevens gave a detailed account of the symptoms of poisoning by this species, in the Journal of Mycology (Volume 9, pages 220-222). Vomiting and diarrhoea were severe. He says: The extreme violence of the symptoms produced by such a small quantity of the fungus makes one wonder what a meal of such might do! The conclusion of the whole matter is: exercise caution, and test with a small or moderate quantity if at all.

We close the comment by quoting, from One Thousand American Fungi, a statement by H. I. Miller: "I have recently measured several which were more than twelve inches across. . . . . Six families, here have eaten heartily of them. The experience is that one or two members of each family are made sick, though in two families, who have several times eaten them, no one was made sick. I enjoy them immensely, and never feel any the worse for eating them. I doubt if we have a finer-flavored fungus. The meat is simply delicious. One fairy ring yields a bushel."

Professor Morgan says: "I am this season (1879) finding elegant specimens of this remarkable Agaric, which was described in the March number of the Botanical Gazette. One plant measures 11 inches across the pileus and is 8½ inches high; the bulbous base of the stipe is 2 inches in diameter, tapering upward to one inch; the heavy movable ring is situated above the middle of the stipe. It is a much heavier and stouter plant than *A. procerus* Scop., though not as tall. It is stouter than any of the *Amanitas* and with a much greater expanse of pileus. It reminds me somewhat of *A. maximus* Fr., though with a much longer stipe and a more regular pileus. I am disposed to claim that it is the largest Agaric in the world. The remarkable thing about the plant, however, and the feature by which it differs from all other *Agarics* and by which it is readily recognied is its *green spores.* When first caught on white paper, the spores of mature specimens are a beautiful bright green; they soon change, however, to a dull green."

FIG. 127. LEP-I-O'-TA MOR-GAN'-I. MORGAN'S AGARIC. See text.

FIG. 128. LEP-I-O'-TA MOR-GAN'-I. MORGAN'S AGARIC. See text.

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# MYCOLOGICAL BULLETIN

## No. 40

*W. A. Kellerman, Ph. D., Ohio State University*

*Columbus, Ohio, August* 15, 1905

THE GENUS PLEU-RO'-TUS.—This interesting group of Gill-fungi, belonging to the series of white-spored Agarics, is concisely described by Professor Atkinson in his Mushrooms Edible and Poisonous, and we can advantageously transcribe his language, which is as follows: "The genus

FIG. 129. PLEU-RO'-TUS UL-MA'-RI-US ELM PLEUROTUS EDIBLE. The half-tone shows two specimens, natural size, taken from the clump illustrated in Fig. 130, where further explanation may be found.

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*Pleurotus* is usually recognized without difficulty among the fleshy, white-spored agarics, because of the eccentric (not quite in the center of the pileus) or lateral stem, or by the pileus being attached at one side in a more or less shelving position, or in some species where the upper side of the pileus lies directly against the wood on which the plant is growing, and is then said to be resupinate. The gills are either decurrent (extending downward) on the stem, or in some species they are rounded or notched at the junction with the stem. There is no annulus, though sometimes a veil, and the genus resembles both *Tricholoma* and *Clitocybe*, except for the position of the stem on the pileus. In *Tricholoma* and *Clitocybe* the stem is usually attached at the center, and the majority of the species grow on the ground, while the species of Pleurotus are especially characterized by growing on wood. Some species, at least, appear to grow from the ground, as in Pleurotus petaloides, which is sometimes found growing on buried roots or portions of decaying stumps which no longer show above ground."

Pleu-ro'-tus ul-ma'-ri-us; Elm Pleu-ro'-tus.—This species is described as usually growing on the Elm—whence the name—but also occurring on other trees. It may be found at wounds where there is decaying wood—but it may occur on the ground as stated in the paragraph below. The mark that distinguishes this large species from the Oyster fungus and other related species is its long stem, usually attached near the center of the cap, and by the gills being rounded or notched at their inner extremity. The pileus is convex, the margin incurved, then nearly expanded. It is smooth and white or whitish; it may be yellowish or brownish in the center.

What the Authors Say of this Species.—It may add to the interest of this subject if some quotations as to the Elm Pleu-ro'-tus are added. Atkinson says: "The elm pleurotus has been long known as an edible fungus, and is regarded as an excellent one for food on account of its flavor and because of its large size. It occurs abundantly during the late autumn, and at this season of the year is usually well protected from the attacks of insects. It occurs in the woods, or fields, more frequently on dead trees. On shade trees which have been severely pruned, and are nearly or quite dead, it sometimes appears at the wounds, where limbs have been removed, in great abundance. In some plants the stems are strongly curved because the weight of the cap bore the plant downward. Sometimes when the plant is growing directly on the upper side of a branch or log, the stem may be central."

McIlvaine says: "The historic elms of Boston Common have borne copious crops of this well-known and easily distinguished species from time immemorial. Every fall, about the first of September, if the season is favorable, later if not, copious crops appear decorating the trunks, and branches, sometimes at a height of thirty or forty feet. Growth takes place where branches have broken off or the trees have been wounded from other causes. They occur very generally on elms in the outlying districts of the city, but rare in the country, seeming to be distinctly urban in their tastes. No damage is apparent from their growth."

Our Illustration of the Elm Pleu-ro'-tus.—The remarkable specimen shown in Fig. 130 differs much from the common type—but they may be representatives of Pleu-ro'-tus ul-ma'-ri-us, as kindly determined for me by Professor Morgan. He remarked concerning them: "Something near Pleurotus ulmarius—the spores of this species, but the form is not typical."

Excellent figures of the Pleurotus ulmarius are given in Atkinson's Mushrooms Edible and Poisonous (on pp. 102-3). He shows two specimens with long, strongly curved stems, as seen from above, from below, and in section. The other species which he illustrates by half-tones are Pleu-ro'-tus os-tre-a'-tus, Pleu-ro'-tus sap'-i-dus, Pleu-ro'-tus dry-i'-nus Pleu-ro'-tus sul-fu-roi'-des and Pleu-ro'-tus pet-a-loi'-des.

FIG. 130. PLEU-RO'-TUS UL-MA'-RI-US ELM PLEUROTUS. EDIBLE. Not the typical or common form; it grows mostly on trees—this clump, however, grew on the ground. It was a large cespitose mass, the size indicated by the scale at the margin of the cut. Two plants from the cluster are shown in Fig. 129. Collected by H. H. York, near Columbus, Ohio, June 1, 1905.

FIG. 131. PO-LE'-TUS FEL'-LE-US. BITTER BOLETUS. A conspicuous species, somewhat resembling the edible Boletus edulis, which is also common. Collected in the woods of the State Farm, Lancaster, Ohio.

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# MYCOLOGICAL BULLETIN

## No. 41

*W. A. Kellerman, Ph. D., Ohio State University*

*Columbus, Ohio, September* 1, 1905

AN AM-A-NI'-TA NUMBER.—The great interest attaching to this genus of Mushrooms, especially on account of numerous poisonous species, warrants further encroachment on our space. Hence this Number of the BULLETIN may be devoted to some figures and comments additional touching the same.

FIG. 132. AM-A-NI'-TA VER'-NA. POISONOUS. Because of its extremely virulent properties it has been called "Destroying Angel." It is pure white, and a beautiful species. Its annulus and volva are very conspicuous and these must always be synonomous with *danger* and *death*. The photo was made from a specimen collected in the woods of the State Farm, Fairfield Co., Ohio, Aug., 1903.

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The Name Amanita.—Turning to Saccardo's Sylloge Fungorum we find this explanation of the name: "Nomen fungi a Galeno inditum, forte a monte *Amano*. (A name given by Galen to a fungus perhaps from mount Amano). As to syllabification and pronunciation of the name some authors put it thus: Am-a-ni'-ta; and others so: A-man'-i-ta. Take your choice.

Size of the Genus.—In Saccardo's compilation 44 species are enumerated for the entire world: to this might be added 25 species of Amanitopsis—the species of the later genus formerly being included under Amanita. Perhaps there are two or three dozen of the American species. Professor Morgan enumerates and gives the description of 28 species in the Journal of Mycology, 3: 25-33, March, 1887. Professor Peck gives 14 species in Report of the New York State Museum, 33: 38-49, 1879. C. G. Lloyd has the same number of species in his Compilation of the Volvae of the United States, 2-7, 1893.

Technical Description of the Genus.—It was the European mycologist, D. C. H. Persoon, who first used the name *Amanita* in modern botany, in his "Synopsis Methodica Fungorum," printed in Goettingen, Germany, in 1801. We will however quote the accurate description as given by the eminent mycologist Fries, which is as follows: "Spores white. Veil or volva universal, at first continuous, distinct from the cuticle of the pileus. Hymenophorum distinct from the stem. All terrestrial."

A General Account of the Amanitas.—In Professor Peck's Thirty-Third Report we find a popular description exactly suited to our purpose; we therefore transcribe the same, regretting only that his excellent Reports the earlier ones especially cannot be in the hands of all my subscribers. Here is his language:—

"The species of Amanita grow on the ground in the woods, groves and copses. They rarely occur in open fields, unless in the vicinity of trees or near the margin of the woods. Thin, open woods and copses afford the most favorable localities. In the early condition the plant is wholly enveloped in its volva, but as it increases in size the volva is necessarily ruptured. In some species, *A. caesarea*, for example, the volva is distinctly membranous, and includes the young plant as if in an oval sack. At length the upper part of the volva is ruptured, and the pileus and stem are exserted. Sometimes one or more irregular and unequal fragments of the ruptured volva adhere to the surface of the pileus for a time, and are carried up by it in its growth. But usually in these species the surface of the pileus is smooth, and the remains of the ruptured volva wholly adhere to the base of the stem or its bulb like a membranous margin, a sheath or a lacerated cup.

(Continued in the next Number.)

FIG. 133. AM-A-NI'-TA SOL-I-TA'-RI-A. POISONOUS. See FIG. 134.

FIG. 134. AM-A-NI'-TA SOL-I-TA'RI-A. POISONOUS. Another of the beautiful white species, *said to be* edible, but I prefer not even to test it. Please use caution. FIG. 133 shows the top of the cap of the same specimen. It was collected in the open woods, sandy soil, of the State Farm. Fairfield Co., Ohio, Aug., 1905.

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# MYCOLOGICAL BULLETIN

## No. 42

*W. A. Kellerman, Ph. D., Ohio State University*
*Columbus, Ohio, September* 15, 1905

(Professor Peck's account of the Amanitas, continued.)

"In other species the volva is not distinctly membranous, but is more floccose or scaly and friable in its character. It envelopes the young plant, but the distinction between the pileus and bulbous base of the stem is soon manifest, and as the stem elongates the upper part of the volva is separated from the lower part, and persistently adheres to the surface of the pileus.

Fig. 135. Hyd'-num zo-na'-tum. A species with a tough almost leathery texture, having a surface of beautiful brown silky lustre, somewhat zoned and with radiating striæ. The spore-bearing spines are shown in the upper figures; two of them show coalesced caps though the stems are separate. The photo was made from specimens collected by the roadside in the woods of the State Farm, located in the sandstone hills of Fairfield Co., Ohio, Aug., 1905.

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As this expands its covering or calyptra breaks up into superficial scales or warts. These are often angular or pyramidal in form, and sometimes unlike the pileus in color, and afford a beautiful ornamentation. The part that remains at the base of the stem often breaks up into mealy or floccose scales, and sometimes wholly disappears when the plant matures. Generally a smooth pileus indicates a perfect membranous volva, and a warty one an imperfect floccose or evenescent one. Sometimes, especially after heavy rains, specimens, which normally have the pileus warty, are found with a smooth pileus; but these are only occasional, and probably mostly accidental cases, the warts having been washed off by the rain.

"Most of the species are solitary or gregarious and of moderate or large size. The pileus, when fully expanded, is nearly plane and quite regular, so that these Agarics are among the most noble and attractive in their appearance. Many of them have a thin pellicle or cuticle, which, in the young or moist plant, is slightly viscid.

"The lamellae in nearly all the species are white or whitish, and free from the stem. Usually they are narrow toward the stem, and cease just before reaching it, thus leaving a small free space around its apex. In many species the short ones that intervene between the long ones are abruptly terminated at their inner extremity, as if truncated or cut square off.

"The stem is usually long and well formed, and in most species is more or less thickened or bulbous at the base. In some species it is hollow or stuffed with cottony fibrils; in others it is solid. In the greater number of species it is furnished with a membranous ring or annulus, that surrounds it near the top like a flabby collar. In the young plant this is stretched from the stem to the margin of the pileus, and wholly conceals the lamellae. As the pileus expands the annulus breaks loose from its attachment to the margin, and remains adhering to the stem. In some species this rupture is not always clean and even, small portions remaining attached to the margin. The annulus then has a lacerated or torn appearance."

Portraits of Amanita.—In the Bulletin we have given heretofore the following species:—Amanita strobiliformis (from Atkinson) p. 56; and A. rubescens. Here we give Amanita verna and A. solitaria. Professor Atkinson figures, in Mushrooms Edible and Poisonous, Amanita muscaria, A. phalloides, A. verna, A. floccocephala, A. velutipes, A. cothurnata, A. spreta, A caesarea (colored), A. rubscens (colored) McIlvaine gives in his book on mushrooms One Thousand American Fungi, colored plates of Amanita spreta, A. phalloides, A. muscaria, A. frostiana, A. chlorosoma, A. rubescens, A. strobiliformis, and a half-tone of A. muscaria. In Nina L. Marshal's Mushroom Book there are given half-tones of Amanita phalloides and A. muscaria. Professor Peck's Reports contain colored plates of some species, as Amanita caesarea, A. rubscens, A. phalloides. A. verna, A. muscaria.

Time for the Bo-le'-ti.—At an early opportune time we must say something in extenso for the numerous species of Boletus. This is the season to study them in the field. Photographs are desired,—but the specimens should be identified by such authorities as Peck, Morgan, Atkinson or Beardslee.

FIG. 136. CAN-THA-REL'-LUS AU-RAN-TI'-A-CUS. Orange Cantharelle. Edible. A common and easily recognized bright orange-colored species that occurs from summer to late autumn. It grows on the ground or on very rotten wood. The yellow decurrent gills are forked, and the pileus is funnel-shaped, at least depressed. The margin is strongly inrolled when young. The color may vary from deep orange to ochre-yellow, often brownish at the centre. Plants from which the illustration is made were collected in open, moist, shady, rich woods near Columbus, Ohio, Aug., 1905.

FIG. 137. BO-LE'-TUS E-DU'-LIS. EDIBLE BOLETUS. This is one of the very large species of Boleti, growing in open woods along their borders, and in open places. It is abundant in warm, wet weather of summer and early autumn. The color of the cap may be dull reddish, reddish-brown, tawny-brown or yellowish. The tubes are white at first, then become greenish-yellow, or yellow when mature. The flesh is white or tinged with yellow. The short stem may or may not be enlarged at the base. The half-tone was made from a photograph of a specimen collected on the State Farm, margin of woods, Fairfield Co., Ohio, August, 1905.

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# MYCOLOGICAL BULLETIN

## No. 43

*W. A. Kellerman, Ph. D., Ohio State University*
*Columbus, Ohio, October* 1, 1905.

ACKNOWLEDGEMENT.—The four half-tones in this No. of the BULLETIN were kindly loaned by the Connecticut Geological and Natural History Survey, to whom we extend thanks for the privilege of using them. They were made from photographs by Professor Edward Albert White of the Connecticut Agricultural College.

PROFESSOR WHITE'S HYMENALES OF CONNECTICUT.—This is Bulletin No. 3 of the Survey referred to in the foregoing paragraph, which is given as a Preliminary Report. It is an annotated list of the Mushrooms of Connecticut accompanied by forty beautiful half-tones printed on heavy plate paper, four samples of which we give in this Number.

FIG 138. HY-GROPH'-O-RUS CON'-I-CUS.—Conical Hygrophorus. Natural size. Cap conical, acute, often lobed, yellow or tinged with crimson. Photograph by Edward Albert White, Connecticut. Cut taken by permission from the Bulletin of the Connecticut Geological and Natural History Survey.

FIG. 139. CLI-TOC'-Y-BE O-DO'-RA.—Fragrant Clitocybe. Natural size. Cap pale, dingy green. From the Connecticut Geological and Natural History Survey. Photograph by Professor E. A. White.

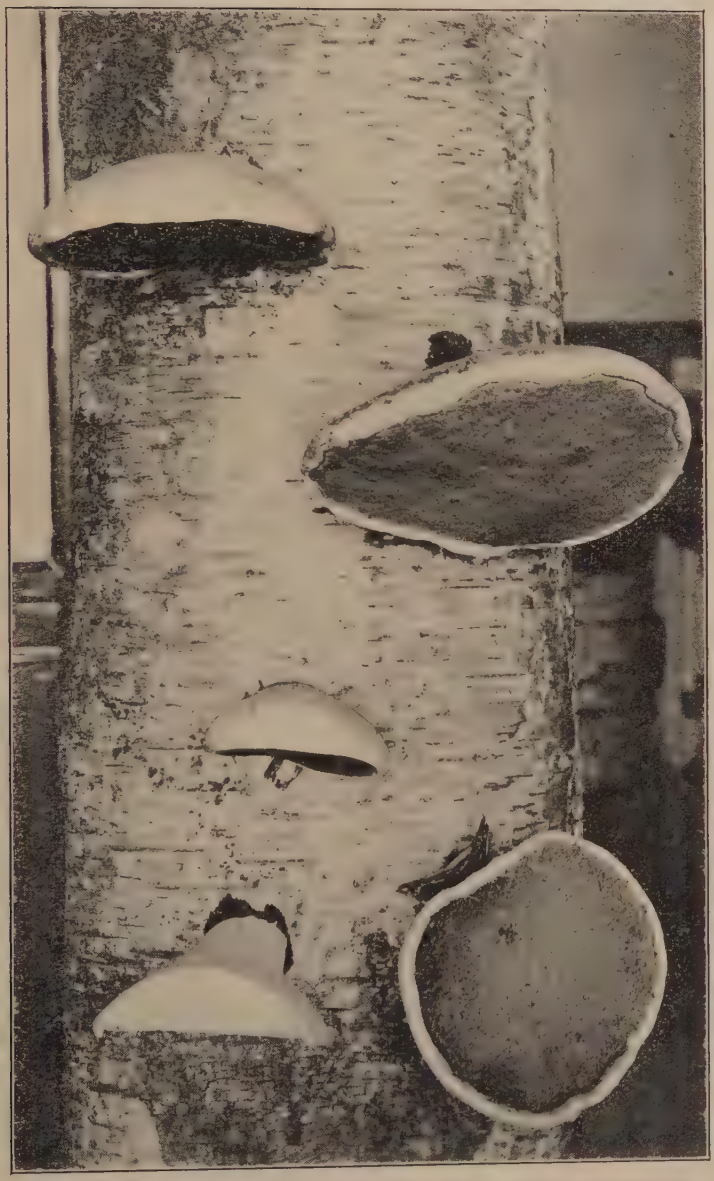

FIG. 140. PO-LY'-PO-RUS BET-U-LI'-NUS. Birch Polyporus. Reduced one-half.
Acknowledgement page 169.

FIG. 141. CREP-I-DO'-TUS MAL-A'-CRI-US. Natural size. Acknowledgement page 169.

THE HALF-TONES in this Number of the BULLETIN are to be found in the Report referred to above, the originals being found as here indicated, namely,

Our Figure 138 is Plate XIII, l. c., page 34.
Our Figure 139 is Plate XVII, l. c., page 37.
Our Figure 140 is Plate XXXVIII, l. c., page 65.
Our Figure 141 is Plate XXII, l. c., page 43.

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# MYCOLOGICAL BULLETIN

## No. 44

*W. A. Kellerman, Ph. D., Ohio State University*

*Columbus, Ohio, October* 15, 1905

THIS IS A POLYPORUS NUMBER.—We find an excellent mycological glossary and classified list of descriptive terms by Dr. Wm. A Murrill, N. Y. Bot. Garden, published in Torreya, which has particular advantages to the student of the Polyporaceae—hence we present it below.

Moreover, Murrill's key to the perennial species of Polyporaceae will prove of value to many of the BULLETIN readers—that also we copy with acknowledgements to the author, and magazine from which it is taken.

It will be noticed that Dr. Murrill has wisely or unwisely split up the old genus *Polyporus*, and, therefore, several new generic names will be encountered in the key.

The two illustrations show one of our commonest species of Polyporus; others of these conspicuous fungi will be given in future Numbers.

### KEY TO THE PERENNIAL POLYPORACEAE.

(*Adapted from Murrill in Torreya, Nov.* 1904)

Hymenium at first concealed by a volva .....*Cryptoporus.*
Hymenium free from the first (*a*).
(*a*). Surface covered with reddish varnish, context corky.... ..... *Ganoderma.*
(*a*). Surface not colored with reddish varnish, or, if so, context woody (*b*).
(*b*). Context and tubes white or pallid.....*Fomes.*
(*b*). Context and tubes brown or dark red (*c*).
(*c*). Hymenophore subsessile, caespitose, arising from a common trunk or tubercle.....*Globifomes.*
(*c*). Hymenophore truly sessile, dimidiate or ungulate, simple or imbricate (*d*).
(*d*). Pileus covered with a horny crust, context punky ..... *Elfvingia.*
(*d*). Pileus not covered with a horny crust or if encrusted, context woody, ferruginous..*Pyropolyporus.*
(*b*). Context dark purple or black.....*Nigrofomes.*

### TERMS APPLIED TO THE SURFACE AND SURFACE APPENDAGES OF FUNGI.

(*Copied from Murrill, in Torreya, April* 1905.)

For words not explained here, see the Mycological Glossary previously published in this BULLETIN.

1. Relating to form:—applanate, *plane,**[1] glabrous, smooth, *even,* depressed, concave, expanded,[2] explanate, contorted, convex, compressed, resupinate, crustaceous.

2. Relating to texture:—mucedinous, confervoid, fibrous, gelatinous, *tremelloid,** soft, waxy, *sebaceous, ceraceous,* fleshy, *carnose,* membranous, *membranaceous,* spongy, bibulous, hygrometric, scariose,[3] *scarious,* papery,*papyraceous, chartaceous,* crustaceous, carbonaceous, cartilaginous, leathery, *coriaccous,* corky, *suberose,* woody, *ligneous,* indurated, bony, *osseous,* horny, *corneous,* rigescent,[4] rigid, elastic, anoderm,[5] tunicate, pelliculose,[6] corticate, encrusted, pellicle, cortex, peridium.

*Terms printed in *italics* are practically synonymous with those preceding them.

NOTE.—1, flat; 2. spread cut; 3, dry and membranous; 4, nearly rigid; 5, without a crust or skin.

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3. Relating to color due to texture:—opaque, pallid, *pallescent,** hygrophanous, polished, unctuous,[7] translucent, *hyalescent, pellucid,* hyaline, *diaphanous, lucid, transparent,* vitreous.

TERMS APPLIED TO THE MARGIN.

Immarginate, truncate, *abrupt,** obtuse, *rotund, tumid,* acute, patent,[8] recurved, *reflexed,* revolute, involute, undulate, striatulate,[9] striate; entire, repand, sinuate, determinate,[10] diffuse, *effuse, indeterminate,* byssoid,[11] *byssaceous,* penicillate, ciliate, fimbrillate, fimbriate, laciniate, lacinulate, *lacinulose,* pectinate, cirrhose,[12] appendiculate; serrulate, serrate, denticulate, dentate, crenulate, crenate, erose,[13] *eroded, premorse,* lacerate, fissile,[14] lobulate, lobed, *lobate,* incised, dissected, multifid, proliferous,[15] merismoid.

TERMS APPLIED TO SURFACE MARKINGS.

1. Rounded Markings.

(a). Dots:—punctate, guttulate, guttate, maculate, *maculose,*[16]

(b). Depressions:—umbilicate, pitted, *foveate,** foveolate, alveolate,[17] favose, lacunose, scrobiculate,[18] porose, cribrose,[19] latticed, *clathrate.*

(c). Elevations:—papillate, *papillose,** postulate, tuberculate, verruculose,[20] verrucose, nodulose, colliculose,[21] callose, bullate,[22] intumescent, tumid, gibbous, strumose,[23] subumbonate, *umbonulate,* umbonate, *bossed.*

2. Elongated Markings.

(a). Irregular:—sinuous, flexuose, tortuous, nebulose,[24] marbled, rivulose,[25] rugulose,[26] rugose, *wrinkled.** labyrinthine, corrugated; rimulose,[27] rimose.

(b). Regular:—confluent, anastomosing, radiating, *radiant,** *radiate,* concentric, circinate; reticulate, *areolate,* tessellate, *tessellated;* plicatulate, plicate, virgate,[28] vittate,[29] costate; grooved, channeled, *canaliculate;* annulate, zonate, *zoned,* fasciated,[30] sulcate, gyrose, *gyrate.*

TERMS APPLIED TO SURFACE COVERINGS.

1. Mucilage:—viscid, *glutinous,** glairy, slimy, *mucilaginous,* varnished, *vernicose, laccate,*

2. Powder:—pruinose, *glaucous,** dealbate,[31] farinose, pulverulent, *pulveraceous,* granular.

3. Scales:—furfuraceous, chaffy, micaceous, squamulose, squamose, *scaly,** imbricate, *imbricated,* squarrulose, squarrose

4. Hairs

(a). Kinds of hairs:—obsolete, evanescent, fugacious, persistent, appressed, innate, filamentous, arachnoid, flaccid, *lax,** fascicled, ramose.

(b). Fine hairs:—glabrate, glabrescent, naked, *calvous,** hoary, *canescent, incanous, incanescent,* satiny, silky, *sericeous,* puberulent, pubescent, *downy,* velvety, *velutinous.*

(c). Coarse hairs:—fibrillose, villose, pilose, *piliferous,** tomentose, *tomentous,* hirtellous, hirsute, shaggy, stupose,[32] wooly, *lanate,* flocculose, floccose, *flocculent,* comose.[33]

(d). Stiff hairs:—hispidulous, septulose, barbulate, strigose,[34] bearded, *barbed,** setose, *setigerous, setaceous, bristly,* hispid, echinate.

5. Sharp elevations:—scabridous,[35] *scabrid,** scabrous, *scabrate, asperate, exasperate, muricate,* aculeolate aculeate, spinose.

NOTE.—6, covered with a thin layer; 7, of oily appearance; 8, spreading (of margin); 9, minutely striate; 10, having a distinct outline (of margin); 11, cobwebby; 12, with a wavy, thread-like appendage; 13, edge ragged as if torn or bitten; 14, may be split; 15, producing offshoots; 16, spotted; 17, like a honey-comb; 18, deeply and irregularly pitted; 19, perforated; 20, with minute wart-like elevations; 21, with hillock-like elevations; 22, blistered; 23, swollen on one side; 24, clouded; 25, with fine, wavy grooves; 26, minutely wrinkled; 27, minutely cracked; 28, streaked; 29, longitudinally strined or ridged; 30, with broad parallel stripes; 31, covered with a white bloom; 32, with matted tow-like hairs; 33, with a tuft of hairs; 34, covered with small bristles; 35, somewhat rough with minute points or short hairs.

*Terms printed in *italics* are practically synonymous with those preceding them.

FIG. 142. PO-LY'-PO-RUS VER-SIC'-O-LOR. A common easily recognized Polypore, the under surface of specimens growing on a rotten branch. The upper side of same is shown in Fig 443.

FIG. 143. PO-LY'-PO-RUS VER-SIC'-O-LOR. Upper side. See also Fig. 142.

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# MYCOLOGICAL BULLETIN

## No. 45

*W. A. Kellerman, Ph. D., Ohio State University*
*Columbus, Ohio, November* 1, 1905

A Bacteria Number—Though these plants would not be called Mushrooms or Toadstools, the Bacteria are fungi and very interesting besides. The group is very large and only a few species are pathogenic—that is, disease-producing. The great majority are harmless to man, but that is telling only half the truth; they are in fact directly or indirectly most beneficial to us. In the Economy of Nature their role is most sig nicant because they disintegrate organic matter and hand back the elements to the mineral kingdom; they prepare the bountiful supply of plant food—thus indirectly making our existence possible. But no space can here be spared to discuss these important organisms or to describe their life cycle. Suffice it to add that many if not most plant diseases are caused by Bacteria. The important publication mentioned in the next number has suggested that this matter be taken up incidentally and some illustrations furnished.

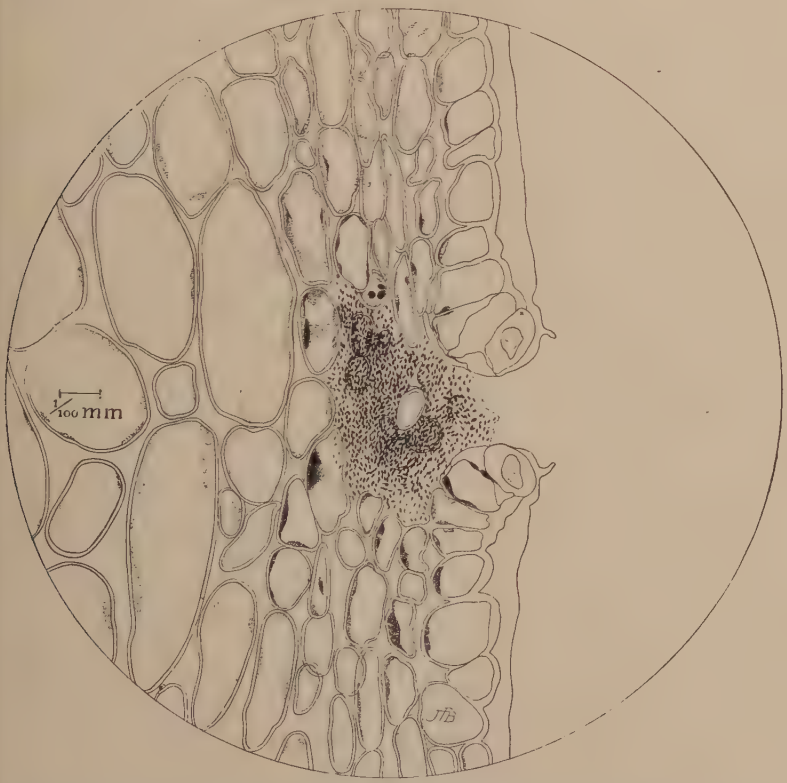


Fig. 144. Bac-te'-ri-um pru'-ni—This is the earliest stage of fruit spot on green plums. The bacteria have entered through the stomate as the section of the fruit highly magnified shows. From Erwin F. Smith's Bacteria in Relation to Plant Diseases.

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## LIST OF MUSHROOM KEYS.

This list includes the commoner accessible keys which beginners, amateurs and students of Mushrooms will ordinarily desire to use. It includes practically all of the conspicuous fungi—at any rate those which are generally spoken of as Mushrooms.

Amanita.
Lloyd; Volvae of U. S. 3, 4, 5, 6. 1898.
McIlvaine; One Thousand American Fungi, 6. 1900.
Morgan; Journal of Mycology, 3:25. March 1887.
Peck; Rep. N. Y. State Mus. 23:68, 1873; 33:40-1, 1880; 48:310, 1895.

Amanitopsis.
Beardslee; Notes on the Amanitas of So. Appalachians. Part I. Lloyd Library, Sept. 1902.
Lloyd; Volvae of the U. S., 8, 9. 1895.

Agaricaceae (Genara).
Atkinson; Mushrooms, Edible, Poisonous, etc., 308.
Nina L. Marshall; Mushroom Book, 32. 1901.
Underwood; Moulds, Mildews and Mushrooms, 1899.
(Genera). White; Conn. Geol. & Nat. Surv. Bull., 3:17, 1905.

Agaricales (Families).
Nina L. Marshall; Mushroom Book, 30. 1901.
Underwood; Moulds, Mildews and Mushrooms, 98, 1899.

Agaricineae (Sections).
Peck; Rep. N. Y. State Mus., 48:231, 1895.

Agaricini (Genera).
Morgan; Jour. Cin. Soc. Nat. Hist., 6:55, 1883.
Peck; Rep. N. Y. State Mus., 23:67, 1873.

Agaricus.
(Natural tribes). Lloyd sec W. G. Smith; Volvae of the U. S., 19.
McIlvaine; One Thousand American Fungi, 332, 1900.
Peck; Rep. N. Y. State Mus., 48:231., 1895.

Armillaria.
(Tribes). McIlvaine; One Thousand Am. Fungi, 52, 1900.
Peck; Rep. N. Y. State Mus., 43:41, 44, 1890.

Ascomycetes.
(Orders). Nina L. Marshall; Mushroom Book, 18, 1901.
(Genera). Nina L. Marshall; Mushroom Book, 20, 1901.
(Orders). Underwood; Moulds, Mildews and Mushrooms, 35, 1899.

Auriculariales (Families).
Underwood; Moulds, Mildews and Mushrooms, 94, 1899.

Basidiomycetes (Orders).
Nina L. Marshall; Mushroom Book, 22, 1901.
Underwood; Moulds, Mildews and Mushrooms, 94, 1899.

Black-spored Agarics [Melanosporae] (Genera). See Agaricaceae. Agaricini.

Bolbitius (See Coprineae).

Boletaceae (Genera).
Nina L. Marshall; Mushroom Book, 44, 102, 1901.
Peck; Bull. N. Y. State Mus., 2:74, Sept. 1889.
Underwood; Moulds, Mildews and Mushrooms, 106, 1899.

Boletinus.
Nina L. Marshall; Mushroom Book, 103, 1901.
McIlvaine; One Thousand Am. Fungi, 398, 1900.

Boletus.
McIlvaine; One Thousand Am. Fungi, 406, 421, 423, 430, 436, 438, 444, 453, 459, 466, 471, 1900.
(Tribes). McIlvaine; One Thousand Am. Fungi, 404, 1900.
Peck; Rep. N. Y. State Mus., 23:127, 1873; 37:58, 1884; 48:292, 1895. Bull. N. Y. State Mus., 1:58, May, 1887; 2:82, 83, 106, 114, 123, 131, 138, 145, 151, Sept, 1889.

CONTINUED IN NEXT NUMBER.

Bacteria in Relation to Plant Diseases.—This is the title of a work of 285 pages—the same (Volume I) being devoted to methods of work and literature. We show some of the illustrations by permission of the author; the electros were kindly placed at our disposal by the Carnegie Institution of Washington, taken from the work issued as their "Publication No. 27."

Fig. 145. Bac-te'-ri-um mal-va-ce-a'-rum—Early stage of infection through a stomate of a leaf of the Cotton plant. From Erwin F. Smith's Bacteria in Relation to Plant Diseases.

Fig. 146. BA-CIL'-LUS CA-RO-TO-VO'-RUS—This shows the Bacteria between cells in the carrot, very highly magnified. From Erwin F. Smith's Bacteria in Relation to Plant Diseases.

To those not familiar with the classification of the Bacteria it may be said that there are several genera recognized by botanists. In a general way we may say the spherical forms are called *Micrococcus*, the oval or short forms are called *Bacterium*, the oblong or elongated forms are *Bacillus*, and the spiral forms belong to the genus *Spirillum*.

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# MYCOLOGICAL BULLETIN

## No.46

*W. A. Kellerman, Ph. D., Ohio State University*
*Columbus, Ohio, November* 15, 1905

THE HALFTONES PRESENTED—They are designed to call attention to publications that may be interesting to many parties. The cut showing Bacteria pertains to what was mentioned in the previous Bulletin. The figures of Collybia and Mycena are taken from an edition of the MUSHROOM BOOK dated 1905. The publishers, Doubleday, Page and Co., apparently now include this volume in their Natural History Library. It differs from the early edition only in having about one and a half dozen additional halftones. These are good figures as the two samples testify which we here show through the kindness of the publishers. The list of additional figures is as follows: Amanitopsis strangulata, Mycena galericulata. Lepiota granosa, Collybia maculata, Collybia platyphylla, Clitocybe illudens, Agaricus campestris, Cortinarius caninus, Cortinarius armillatus, Hydnum coralloides, Clavaria ligula, Strobilomyces strobilaceus, Boletus felleus, Boletus scaber, Polyporus fomentarius, Calostoma (four species) Leotia lubrica, Tremellodon gelatinosum, Peziza aurantia, Peziza odorata, and Panus strigosus.

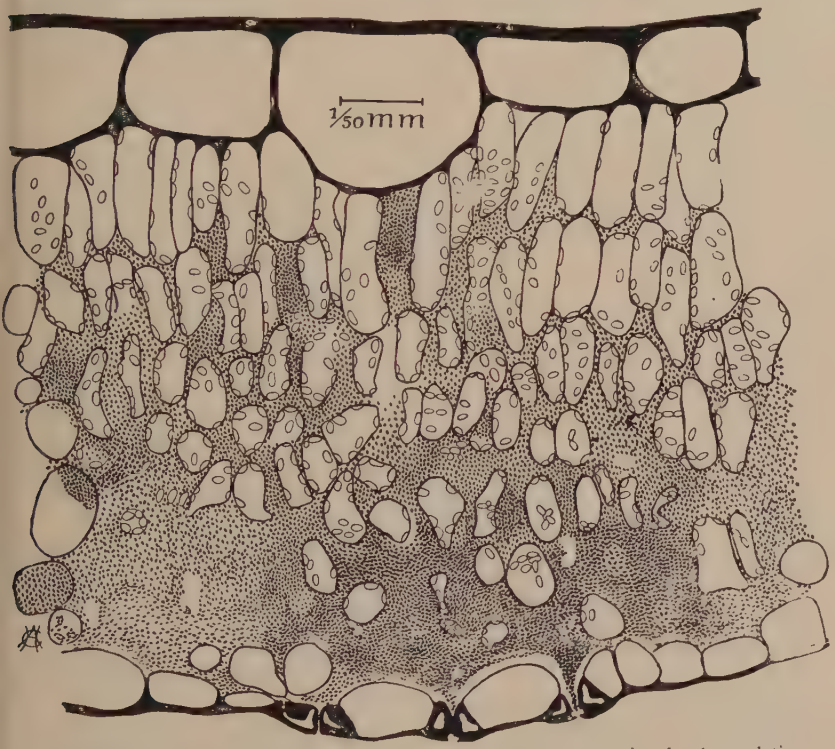


Fig. 147. BAC-TE'-RI-UM PRU'-NI. This represents a stage in the innoculation of the tissue of the plum somewhat more advanced than that shown in Fig. 144. The Bacteria here abundant in the mesophyll are supposed to have entered through the stomates, three of which appear in the section. The figure is taken from Erwin F. Smith's Bacteria in Relation to Plant Diseases.

University Bulletin. Series 9. No. 34. Entered as Second Class Matter. Post-office at Columbus. Ohio

## LIST OF MUSHROOM KEYS.

CONTINUED FROM PRECEDING NUMBER.

Bovistae.
Lloyd; Myc. Notes [200] No. 12:114, Dec., 1902.
Brown-spored Agarics. (Same as purplish or brown-spored Agarics.)
Catastoma.
Kellerman; Jour. Mycol., 9:239, Dec. 1903.
Lloyd; Myc. Notes [214] No. 13:121, Feb., 1903.
Cantharellus.
(Tribes). McIlvaine; One Thousand Am. Fungi, 215, 1900.
Peck; Rep. N. Y. State Mus., 23:121, 1873; 37:35, 1884. Bull. N. Y. State Mus., 1:35, May, 1887.
Clathraceae (Genera).
Underwood; Moulds, Mildews and Mushrooms, 132, 1899.
Claudopus.
McIlvaine; One Thousand Am. Fungi, 266, 1900.
Peck; Rep. N. Y. State Mus., 39:67, 1886.
Clavaria.
(Tribes). McIlvaine; One Thousand Am. Fungi, 513, 1900.
Peck; Rep. N. Y. State Mus., 24:104, 1873.
Clavariaceae (Genera).
McIlvaine; One Thousand Am. Fungi, 511, 1900.
Underwood; Moulds, Mildews and Mushrooms, 102, 1899.
Clitocybe.
(Tribes). McIlvaine; One Thousand Am. Fungi, 83, 1900.
Morgan; Jour. Cin. Soc. Nat. Hist., 6:67, 1883.
Peck; Rep. N. Y. State Mus., 23:76, 1873; 48:270, 1895.
Clitopilus.
Beardslee; Jour. Mycol. 11:109, May, 1905; Mycol. Bull., 3:146, July, 1905.
McIlvaine; One Thousand Am. Fungi, 255, 1900.
Peck; Rep. N. Y. State Mus., 42:40, 1889.
Collybia.
Lloyd; Mycol. Notes, 34, 37, 41, Dec., 1900.
(Tribes). McIlvaine; One Thousand Am. Fungi, 112, 1900.
Morgan; Jour. Cin. Soc. Nat. Hist., 6:70, 1883.
Peck; Rep. N. Y. State Mus., 23: 78, 1873.
Coprinarii. (See Black-spored Agarics.)
Coprineae.
Earle; Torreya, 2:37-40, March, 1902.
Coprinus.
(Tribes). McIlvaine; One Thousand Am. Fungi, 369, 1900.
Peck; Rep. N. Y. State Mus., 23:103, 1873; 48:241, 1895.
Coprinus. (See Coprineae.)
Cortinarius.
Earle; Torreya, 2:169-172, 180-3, Nov., Dec., 1902.
(Tribes). McIlvaine; One Thousand Am. Fungi, 307, 1900.
Peck; Rep. N. Y. State Mus., 23:105, 107, 108, 110, 112, 1873; 48:245, 1895.
Kauffman; Bull. Torr. Bot. Club, 32:303, 318, June, 1905.
Craterellus.
Peck; Rep. N. Y. State Mus., 37:45, 1884. Bull. N. Y. State Mus. 1:45, May, 1887.
Dermini [Ochre-spored] (Genera).
Morgan; Jour. Cin. Soc. Nat. Hist., 6:100, 1883.
See also Agaricaceae, Agaricini.
Discomycetes (Genera).
Peck; Rep. N. Y. State Mus., 48:221, 1895.

Entoloma.
(Tribes). McIlvaine; One Thousand Am. Fungi, 250, 1900.
Morgan; Jour. Cin. Soc. Nat. Hist., 6:99, 1883.
Flammula (Tribes).
McIlvaine; One Thousand Am. Fungi, 287, 1900.
Peck; Rep. N. Y. State Mus., 23:90, 1873.
Fomes.
Murrill; Bull. Torr. Bot. Club, 30:225-6, April, 1903.
Fungi (Classes).
Nina L. Marshall; Mushroom Book, 16, 1901.
Morgan; Jour. Cin. Soc. Nat. Hist., 6:54, 1883.
Galera.
Peck; Rep. N. Y. State Mus., 23:92, 1873; 46:62, 1893.

CONTINUED IN NEXT NUMBER.

LIST OF MUSHROOM KEYS—We began in the preceding No. of the BULLETIN a list of accessable KEYS which in many cases will doubtless prove useful to students of Mushrooms. It is not intended to be a complete list, but it is hoped that not many important groups have been omitted. The list will be continued through several Numbers.

Fig. 148. COL-LY'-BI-A PLAT-Y-PHYL'-LA—Broad-gilled Collybia. A white-spored edible Agaric of easy recognition by the very broad gills. There is no volva and no ring in any of the Collybias. This mushroom is whitish, varying to gravish brown or dark brown. Atkinson says the plant somewhat resembles certain species of Tricholoma and care should be used in selecting it in order to avoid the suspected species of Tricholoma. The figure is taken with permission of the publishers from Nina L. Marshall's Mushroom Book.

Fig. 149. MY-CE'-NA GA-LER-IC-U-LA'-TA—This is said to be a common species of summer and autumn growing on dead logs, stumps, branches, etc., in the woods. It is usually clustered; the slender hollow stems are hairy at the base. The caps are gray or brown. The figure is taken by permission of the publishers from Nina L. Marshall's Mushroom Book.

**The Mycological Bulletin is issued on the 1st and 15th of each Month, Price 25c. Copies of Vol. II (1904) may be had for 50 cents each, or cloth bound copies for 75 cents. No copies remain of Vol. I (1903). Address, W. A. Kellerman Columbus Ohio.**

# MYCOLOGICAL BULLETIN

## No.47

*W. A. Kellerman, Ph. D., Ohio State University*
*Columbus, Ohio, December* 1, 1905

C. G. Lloyd's Mycological Notes.—Only beginners need be told that Mr. C. G. Lloyd of Cincinnati knows all about Puffballs and some other things too, and that he publishes and distributes gratis to the devoted a periodical under the above name. Twenty Nos. have been issued. To show what he is doing in the way of half-tone illustrations we have borrowed some cuts and show them on two pages of this Number. They are figs. 150, 151 and 152.

Fig. 150 Ly-co-per'-don tes-sel-la'tum. From Lloyd's Myc. Notes.

Fig. 151 Ly-co-per'-don gem-ma'-tum. From Lloyd's Myc. Notes.

University Bulletin. Series 9, No. 35. Entered as Second Class Matter. Post-office at Columbus, Ohio

## LIST OF MUSHROOM KEYS.

CONTINUED FROM PRECEDING NUMBER.

Gasteromycetes.
(Families). McIlvaine; One Thousand Am. Fungi, 569, 1900.
(Orders). Nina L. Marshall; Mushroom Book, 24, 1901.
(Orders). Morgan; Jour. Cin. Soc. Nat. Hist., 12:143, Jan., 1889.
Gomphidius. (See Hygrophoreae.)
Hebeloma.
(Tribes). McIlvaine; One Thousand Am. Fungi, 283, 1900.
Peck; Rep. N. Y. State Mus., 23:95, 1873.
Helvellaceae (Genera).
McIlvaine; One Thousand Am. Fungi, 534, 1900
Helvellales (Families and Genera).
Underwood; Moulds, Mildews and Mushrooms, 63, 1899.
Hydnaceae (Genera).
Underwood; Moulds, Mildews and Mushrooms, 103, 1899
Hydnei (Genera).
Morgan; Jour. Cin. Soc. Nat. Hist., 10:7, 1887.
Hydnum (Tribes).
McIlvaine; One Thousand Am. Fungi, 494, 1900.
Hygrophoreae.
F. S. Earle; Torreya, 2:53-4, 73-4, Apr., May, 1902.
Hygrophorus.
(Tribes). McIlvaine; One Thousand Am. Fungi, 148, 1900.
Peck; Rep. N. Y. State Mus., 23:112, 1873.
Hymeniales (Families).
White; Conn. Geolog. and Nat. Hist. Surv. Bull., 3:12, 1905.
Hymenogastrales (Genera).
Underwood; Moulds, Mildews and Mushrooms, 135, 1899.
Hymenomycetes (Families).
Atkinson; Mushrooms, Edible, Poisonous, etc., 307.
Atkinson and Stoneman; A Provisional Key to the Genera of Hymenomycetes, 1-16, Oct., 1898.
McIlvaine; One Thousand Am. Fungi, 1, 1900.
Morgan; Jour. Cin. Soc. Nat. Hist., 6:55, 1883.
Peck; Rep. N. Y. State Mus., 48:230, 1895.
Hypholoma
McIlvaine; One Thousand Am. Fungi, 353, 355, 1900.
Peck; Rep. N. Y. State Mus., 23:98, 1873.
Hyphorodii [Rosy-spored Agarics] (Genera).
Morgan; Jour. Cin. Soc. Nat Hist., 6:97, 1883.
See also Agaricaceae, Agaricini.
Inocybe.
Earle; Torreya, 3:168-170, 183-4, Nov., Dec., 1903.
Morgan; Jour. Cin. Soc. Nat. Hist., 6:104, 1883.
Lactarius.
F. S. Earle; Torreya, 2:139-41, 152-4, Oct., 1902.
(Tribes). McIlvaine; One Thousand Am. Fungi, 162, 1900.
Peck; Rep. N. Y. State Mus., 23:114, 1873; 38:113, 1885.
Lepiota.
(Tribes). McIlvaine; One Thousand Am. Fungi, 34, 1900.
Morgan; Jour. Cin. Soc. Nat. Hist., 6:60, 1883.
Peck; Rep N. Y. State Mus., 23:70, 1873.
Lentinus.
Earle; Torreya, 3:35-8, March, 1903.
(Tribes). McIlvaine; One Thousand Am. Fungi, 229, 1900.
Peck; Rep. N. Y. State Mus., 23:126, 1873.
Leucosporae [White-spored Agarics] (Genera).
Peck; Rep. N. Y. State Mus., 48:252, 1895.
See also Agaricaceae and Agaricini.

Lycoperdaceae (Genera).
McIlvaine; One Thousand Am. Fungi, 577, 1900
Morgan; Cin. Soc. Nat. Hist., 12:9, April, 1889.
Underwood; Moulds, Mildews and Mushrooms, 138, 1899.
Lycoperdales (Genera).
Nina L. Marshall; Mushroom Book, 28, 1901.
Lycoperdon.
McIlvaine; One Thousand Am. Fungi, 590, 1900.
Morgan; Cin. Soc. Nat. Hist., 13:6, April, 1891.
Marasmius.
(Tribes). McIlvaine; One Thousand Am. Fungi, 221, 1900.
Peck; Rep. N. Y. State Mus., 23:124, 1873.
Melanosporae [Black-spored Agarics] (Genera).
See Agaricaceae, Agaricini.
Mitremyces.
Lloyd; Myc. Notes (218) No. 13:125, Feb., 1903.
Morchella.
Kellerman; Myc. Bull., 1:6, March 25, 1903.
Nina L. Marshall; Mushroom Book, 102, 1901.
Peck; Rep. N. Y. State Mus., 48:222, 1895.
Mycena.
(Tribes). McIlvaine; One Thousand Am. Fungi, 224, 1900.
Morgan; Jour. Cin. Soc. Nat. Hist., 6:73, 1883.
Peck; Rep. N. Y. State Mus., 23:80, 1873.
Naucoria.
(Tribes). McIlvaine; One Thousand Am. Fungi, 294, 1900.
Peck; Rep. N. Y. State Mus., 23:91, 1873.
Nidulariaceae.
(Genera). Underwood; Moulds, Mildews and Mushrooms, 142, 1899.
V. S. White; Bull. Torr. Bot. Club, 29:254, May, 1902.
Ochre-spored Agarics [Ochrosporae] (Genera).
See Agaricaceae, Agaricini, Dermini.
Ochrosporae [Ochre-spored] (Genera).
See Agaricaceae, Agaricini, Dermini.
Omphalia.
(Tribes). McIlvaine; One Thousand Am. Fungi, 133, 1900.
Morgan; Jour. Cin. Soc. Nat. Hist., 6:75, 1883.
Peck; Rep. N. Y. State Mus., 23.84, 1873; 45:33, 1893.
Panaeolus.
Peck; Rep. N. Y. State Mus., 23:100, 1873.
Panus.
Earle; Torreya, 3:86-7, June, 1903.
Paxillus.
(Tribes). McIlvaire; One Thousand Am. Fungi, 326, 1900.
Peck; Rep N. Y. State Mus., 37:30, 1884. Bull. N. Y. State Mus., 1:30, May, 1887.
Periconia.
F. S. Earle; Bull. N. Y. State Bot. Garden, 2:(332), 25, April, 1902.
Peziza (Tribes).
McIlvaine; One Thousand Am. Fungi, 552, 1900.
Pezizales (Families).
Underwood; Moulds, Mildews and Mushrooms, 51, 1899.
Phallaceae (Genera).
Urderwood; Moulds, Mildews and Mushrooms, 132, 1899.
Phallales.
(Families and Genera). Nina L. Marshall; Mushroom Book, 26, 1901.
(Families). Underwood; Moulds, Mildews and Mushrooms, 132, 1899.
Phalloideae (Genera).
McIlvaine; One Thousand Am. Fungi, 570, 1900.
Morgan; Cin. Soc. Nat. Hist., 12:144, Jan., 1889.

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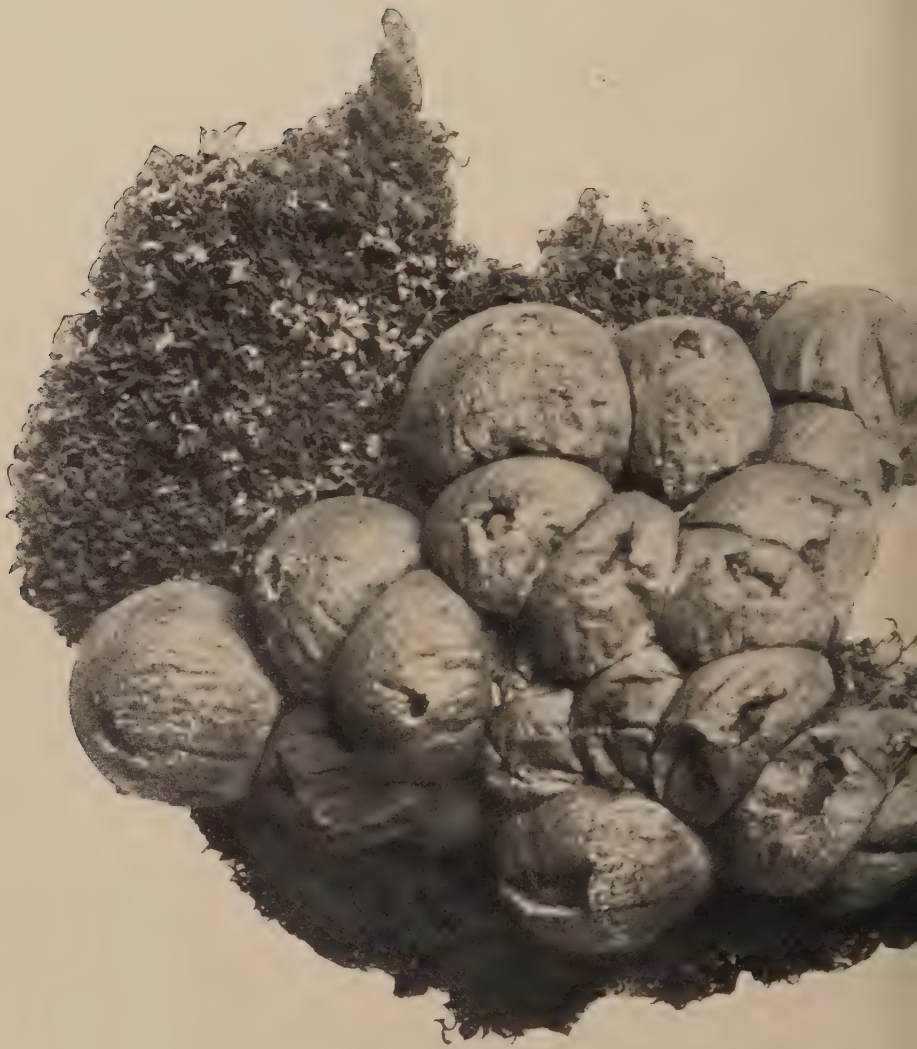

FIG. 152 LY-CO-PER'-DON PI-RI-FOR'-ME. From Lloyd's Myc. Notes.

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# MYCOLOGICAL BULLETIN

## No. 48

*W. A. Kellerman, Ph. D., Ohio State University*

*Columbus, Ohio, December* 15, 1905

End of Volume III.—The plan and scope of the Bulletin as exhibited by the successive current Numbers seem to have the approval of those interested. The year 1905 then will require no change. Subscribers will receive notice of their dues annually. While the subscription price is 25 cents a year, 50 cents each will be charged for the few remaining copies of preceding volumes; when bound in cloth the price is 75 cents.

Frontispiece.—It is a pleasure to present the portrait of one of England's pioneer Mycologists, Dr. M. C. Cooke. Though living yet and interested in Mushrooms, his most important work was done over a quarter of a century ago.

### LIST OF MUSHROOM KEYS.

CONCLUDED FROM PRECEDING NUMBER.

Phallus.
McIlvaine; One Thousand Am. Fungi, 571, 1900.

Pholiota.
(Tribes). McIlvaine; One Thousand Am. Fungi, 269, 1900.
Morgan; Jour. Cin. Soc. Nat. Hist., 6:101, 1883.

Pleurotus.
(Tribes). McIlvaine; One Thousand Am. Fungi, 135, 1900.
Morgan; Jour. Cin. Soc. Nat. Hist., 6:77, 1883.
Peck; Rep. N. Y. State Mus., 39:59, 1886; 48:275, 1895.

Pleuteolus.
Earle; Torreya, 3:124-5, Aug. 1903.
Peck; Rep. N. Y. State Mus., 46:59, 1893.

Pluteus.
McIlvaine; One Thousand Am. Fungi, 243, 1900.
Morgan; Jour. Cin. Soc. Nat. Hist., 6:97, 1883.
Peck; Rep. N. Y. State Mus., 23:61, 86, 1873; 38:134, 1885.

Polyporaceae (Subfamilies).
Murrill; Bull. Torr. Bot. Club, 32:353, 1905.

Polyporaceae (Genera).
Atkinson; Mushrooms, Edible, Poisonous, etc., 171.
McIlvaine; One Thousand Am. Fungi, 396, 1900.
Nina L. Marshall; Mushroom Book, 42, 1901.
Murrill; Bull. Torr. Bot. Club, 32:353, 364, 370, 469, 485, 490, 491, 1905.
Underwood; Moulds, Mildews and Mushrooms, 104,1899.

University Bulletin, Series 9, No. 36. Entered as Second Class Matter, Post-office at Columbus, Ohio

Polyporaceae.
Murrill; Bull. Torr. Bot. Club, 29:601, 1902; 30:109, 225, 297, 426, 1903; 31:30, 326, 334, 342, 416, 427, 594, 1904; Torreya, 4:165, Nov., 1904; 5:28, 43, Feb., March, 1905.

Polyporus.
(Tribes.) McIlvaine; One Thousand Am. Fungi, 479, 1900.

Pratelli [Purplish or Brown-spored Agarics] (Genera).
Morgan; Jour. Cin. Soc. Nat. Hist., 6:111, 1885.
See Agaricaceae, Agaricini.

Psalliota.
Peck; Rep. N. Y. State Mus., 23:97, 1893; 36:42, 1883.
See also Agaricus.

Psathyrella.
Peck; Rep. N. Y. State Mus., 23:102, 1873.

Psilocybe.
Peck; Rep. N. Y. State Mus., 23:99, 1873.
Purplish or Brown-spored Agarics [Porphyrosporae] (Genera).
See Agaricaceae, Agaricini, Pratelli.

Rhodosporae [Rosy-spored Agarics] (Genera).
See Agaricaceae, Agaricini.

Rosy-spored Agarics [Rhodosporae] (Genera).
See Agaricaceae, Agaricini, Hyporhodii.

Russula.
Earle; Torreya, 2:101-3, 117-9, July, Aug., 1902.
(Tribes). McIlvaine; One Thousand Am. Fungi, 186, 1900.
Peck; Rep. N. Y. State Mus., 23:120, 1873.

Sclerodermatales (Genera).
Underwood; Moulds, Mildews and Mushrooms, 143, 1899

Stropharia.
Earle; Torreya, 3:24, Feb., 1903.
(Tribes). McIlvaine; One Thousand Am. Fungi, 349, 1900.

Thelephoraceae (Genera).
McIlvaine; One Thousand Am. Fungi, 506, 1900.
Underwood; Moulds, Mildews and Mushrooms, 100, 1899.

Thelephorei (Genera).
Morgan; Jour. Cin. Soc. Nat. Hist., 11:188, 1888.

Tremellaceae (Genera).
McIlvaine; One Thousand Am. Fungi, 526, 1900.

Tremellales (Families and Genera).
Underwood; Moulds, Mildews and Mushrooms, 95, 1899.

Tricholoma.
(Tribes). McIlvaine; One Thousand Am. Fungi, 59, 1900.
Morgan; Jour. Cin. Soc. Nat. Hist., 6:65, 1883.
Peck; Rep. N. Y. State Mus., 23:73, 1873; 44:39, 40, 44, 52, 56, 61, 1891; 48:266, 1895.

Tuberales (Families).
Underwood; Moulds, Mildews and Mushrooms, 51, 1899.

Tylostomeae (Genera).
Lloyd; Myc. Notes (233) No. 14:133, March, 1903.

Volvaria.
Lloyd; Volvae of U. S., 10, 1898.
McIlvaine; One Thousand Am. Fungi, 239, 1900.

White-spored Agarics [Leucosporae] (Genera).
See Agaricaceae, Agaricini, Leucosporae.

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End of Volume III.

# Mycological Bulletin

## No. 49

*W. A. Kellerman, Ph. D., Ohio State University*

*Columbus, Ohio, January 1, 1906.*

ANOTHER NOTION.—For a few months we will devote regularly a page, or as much thereof as may seem fitting, to quotations from various authors touching on matters of mycological interest. Many of course will get these articles in other journals that come regularly to their tables or encounter them in mushroom books, but I aim in spite of this to maintain the established character of the BULLETIN, to-wit, that is designed first and foremost for the benefit of beginners and amateurs who presumably have not large libraries nor files of all the botanical journals. The illustrations will be the prominent feature as heretofore and two or three

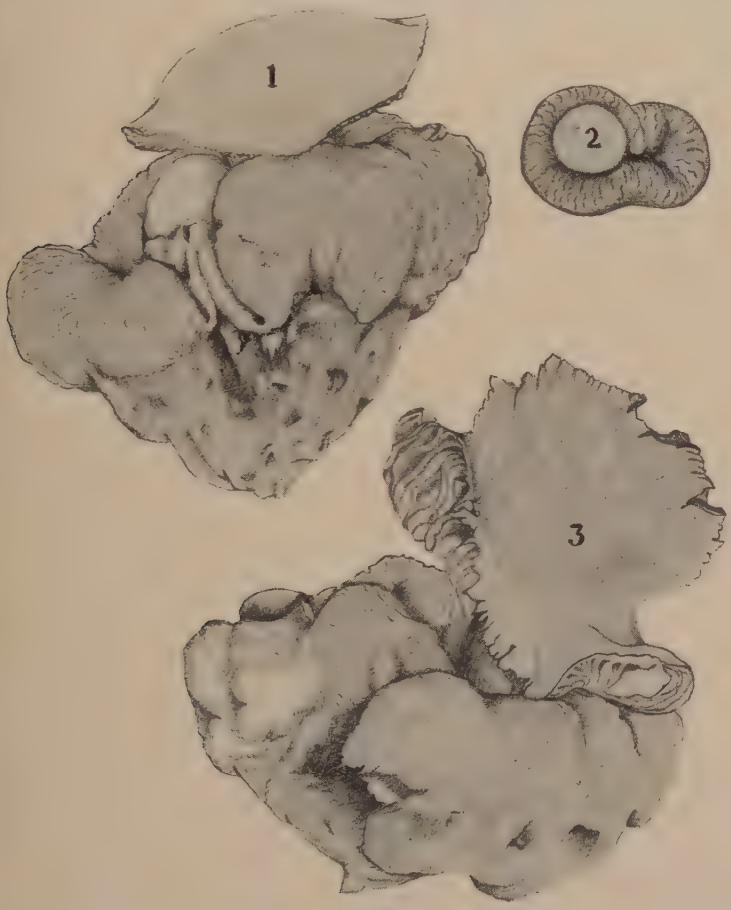


FIG 153—PAN-AE'-O-LUS EP-I-MY'-CES PECK, see text of Bulletin No. 49 ["Quotation"] for explanation of this Mushroom. Drawings by Helen Shooman, Wisconsin University.

University Bulletin, Series 9, No. 37. Entered as Second Class Matter, Post-office at Columbus, Ohio

halftones will be presented in each issue. My patrons are assured that contributions both in the way of notes and photographs will be received with pleasure. It is hoped that portions of letters pertaining to Mushrooms may occupy a conspicuous place on the "quotation" page.

PHOTOGRAPHS.—Being the merest amateur in photography I appreciate the ludricous pose assumed when suggestions are offered yet (never let on!) it may be remarked that the photos should be natural size or even enlarged unless the Mushrooms are of great size. If one would remember also that the printed page is only four inches wide the illustrations doubtless would be in most cases advantaged. The height is seldom restricted by page limits. The engraver can reduce the pictures when necessary and in that way obviate loss in reproduction. Enlargement is out of the question unless the photo is unusually sharp and presents sharp contrasts. Characteristic "attitudes," strange habitats, abnormal forms, plants in situ, and other "original" illustrations of mushrooms will be most acceptable.

WITH A LONG ARM.—The editor will land in that enchanting tropical region of Guatemala the day this Number reaches the subscribers, and therefore the BULLETIN will be edited at a disadvantage for three or four months. Some one at home will be commissioned to examine my mail—so the mistakes made in the distribution or other various concerns of this Leaflet, will have attention, if you will kindly send in your suggestions and criticisms. Reception of the BULLETIN will indicate to new subscribers that the annual fee is received—and old subscribers will receive a dun on my return if.. ...

## "QUOTATION PAGE."

QUOTATION.—The following interesting article appeared in the Journal of Mycology, and shoud be copied here since the plate has been reproduced in the BULLETIN, see page 193.

"THE HOST PLANTS OF PANAEOLUS EPIMYCES, PECK.—Panaeolus epimyces, first discovered and described by Peck, has been found from time to time more or less abundantly in the vicinity of Madison, Wis. The same species has been reported near London, Ontario, from when it was sent by Dearness to the Lloyd Mycological Museum. Neither Peck nor Dearness mentioned the host plant of this fungus.

"Peck's description is as follows: Pileus fleshy, at first sub-globose, then convex, white, silky-fibrillose, flesh soft, white or whitish; lamellae rather broad, somewhat close, rounded behind, adnexed, dingy white becoming brown or blackish with a white edge; stem short tapering upward, strongly striate and minutely mealy or pruinose, solid in the young plant, hollow in the mature plant, but with the cavity small, hairy or substrigose at the base; spores elliptical black, .0003'-.00035' long, .0002'-.00025' broad Plant 1'-1.5' high, pileus 8"-12" broad, stem 3"-4" thick. Parasitic on fungi.

"North Greenbush, November.

"Specimens found in this region agree with this description quite closely. The only points of difference are that the pileus and spores are larger. The pileus is sometimes over 2 in. broad and the spores run up to .0004' long by .00028' broad.

"McKenna, in 1900, studied the material collected at Madison and identified the host of all the specimens found up to that time as Coprinus atramentarius (Bull.) Fr. His material was always found growing in close connection with uninfected clumps of C. atramentarius. Upon sectioning the thickened edges of the hypertrophied mass of the host, he found the gills and hymenium well developed. He also found mature spores which were identical with those of C. atramentarius. From one to seven of the parasitic fruit bodies were found on a single host.

"On October 6, 1904, four very perfect and well developed specimens of Panaeolus epimyces were found on a shady lawn apparently parasitic on Coprirus comatus Fr. Several large healthy specimens of the latter were found not more than 5 in. distant from any one of the infected forms and no other Agaric was or has since been found growing in that vicinity.

(*Continued in No. 50*).

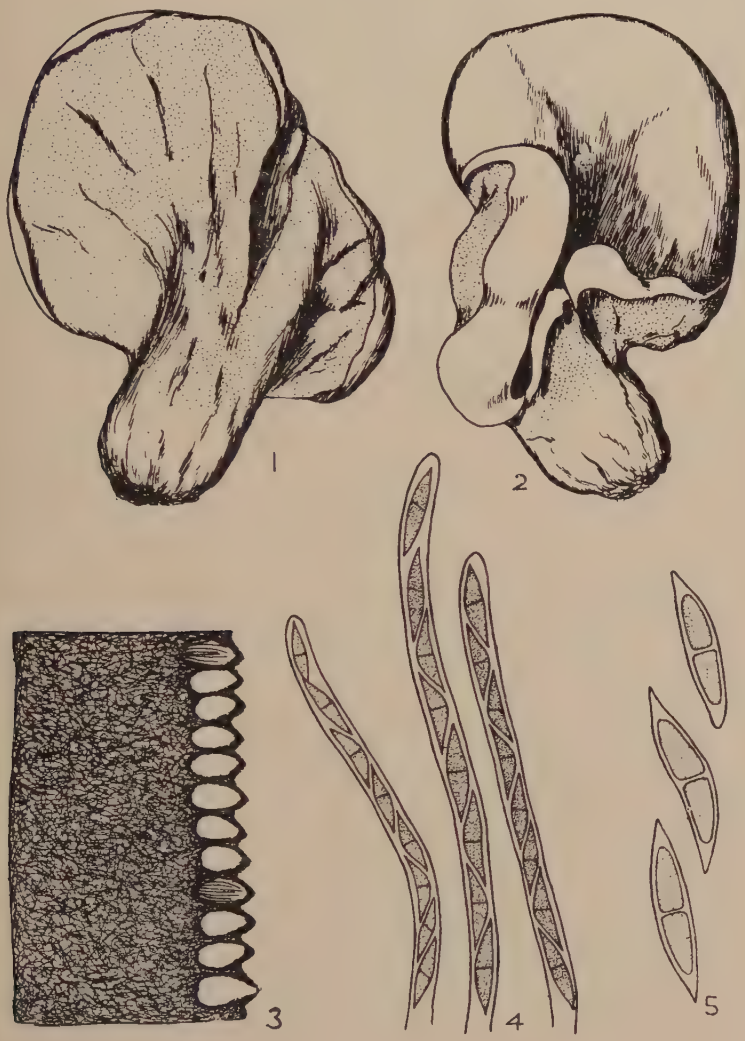


FIG. 154.—HY-POM'-Y-CES LAC-TI-FLU-O'-RUM. A parasitic fungus which has attacked a gill-fungus, in consequence of which the latter was aborted and unable to develop the lamellae or gills The illustrations 1 and 2 show such hosts. No. 3 represents a section through the aborted mushroom and shows the microscopic fruiting portion of the attacking Hypomyces. Each of the receptacles contains very many asci, as they are called, that is to say, large cells in which the bilocular spores are developed; they are both shown at Nos. 4 and 5. Illustrations 1 and 2 are shown natural size; No. 3 is somewhat magnified; No. 4 shown on a larger scale and No. 5 very highly magnified.

FIG. 155—LY-CO-PER'-DON ECH-I-NA'-TUM (a, b, c, d); LY-CO-PER'-DON TES-SEL-LA'-TUM (e); LY-CO-PER'-DON UM-BRI'-NUM (f); taken from Lloyd's Myc. Notes.

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# Mycological Bulletin

## No. 50

*W. A. Kellerman, Ph. D., Ohio State University*
*Columbus, Ohio, January* 15, 1906.

THE ILLUTRATIONS PRESENTED.—The first and last illustrations in this Number are very common fungi—the first a Cor-ti-na'-ri-us and the last a Hy-groph'-o-rus. It must be admitted, however, that the species of these two genera are not readily determinable by the beginner—in fact only specialists comprehend the situation. The illustration on the third is out of the ordinary for this Leaflet. But it is so conspicuous and this

FIG. 156—COR-TI-NA'-RI-US CIN-NA-MO'-ME-US.—A very dark colored common Corti-na'-ri-us (this genus has an arachnoid, *i. e.* a cabwebby veil) which was collected by Supt. M. E. Hard and the writer in the woods near Chillicothe, O., Oct. 30, 1905.

University Bulletin, Series 9, No. 38. Entered as Second Class Matter, Post-office at Columbus, Ohio

parasitic fungus is so common that it can not be neglected by the wide-awake amateur or the beginner. It is the *first of the three stages* in the life-cycle of a Black Rust. The second and third stages of this species are found (associated) on a Sedge, or Slough Grass (Carex). See explanation under figures.

## "QUOTATION PAGE."

(*Quotation continued from page* 194).

"These specimens resembled the herbarium specimens of those parasitic on C. atramentarius (as identified by McKenna), but with some variations. They are considerably larger, but the greater size is only proportional to the greater size of C. comatus as compared with C. atramentarius. The pileus in one specimen is 3.5′ broad. Here and there portions of the veil adhere to the pileus, forming a fringe on the young cap. The surface of the cap is roughened by reticulate umber colored areas, especially at the margin, which latter become elevated and flaky, breaking up into recurved umber patches. The stipe is cylindrical 1.5′ long by 5″ in diameter in the largest specimen. The spores vary in size from .0003′-.0004′ by .0002′-.00028′.

"The hypertrophied host resembles that described by McKenna, but is larger, becoming from 2 to 3 inches in diameter by 2 inches high. It forms a cup-shaped or cushion-like mass with swollen edges and a deep indentation at the top. Sometimes a single large carpophore arises from the center of this indentation. In other cases two or more are present in various stages of development. The mass of the host is scarcely distinguishable as stipe and pileus. It is merely narrowed below and is connected directly with thick mycelial strands ramifying in the substratum. The outside is striate and covered with brownish fibres, especially that portion which corresponds to the pileus. The thickened edges of the hypertrophied host were examined, and although the gills, basidia and sterigmata could be distinctly made out, the fungus was apparently not sufficiently matured to produce spores.

"The reasons for believing the host in this case to be Coprinus comatus are as follows: The fungi in question are accompanied by growths of C. comatus only, and the host resembles closely the form identified from its spores as C. atramentarius by McKenna, but is as much larger than that form as Coprinus comatus is larger than Coprinus atramentarius.

"So called abortive forms very similar to these parasitized Coprini have been described for Clitopilus prunulus Scop, Clitopilus abortivus B. & C. and Armillaria mellea Vahl, but the cause of these formations is still unexplained. Clitopilus prunulus produces aborted forms singly or in tufts. They are very variable in shape and are white tinged with brown on ruptured surfaces.

"Peck in describing the aborted forms of Clitopilus abortivus B. & C. says they are irregular or sub-globose fleshy white masses occurring in company with normal forms and apparently under the same conditions of soil, moisture and temperature. These forms are common here and are found in various stages of development. Some show marked characteristics of the normal form of C. abortivus, while others are hypertrophied and contorted into masses resembling closely the forms described above for the Coprini. They are smaller, however, the largest not being over 1-1½ in diameter The gills show plainly on sectioning.

"The abortive forms of Armillaria mellea Vahl are also common in this region are very similar to those of the two Clitopili just mentioned. Peck states in his description of this from that the masses are of cellular matter without any distinction of stem, pileus or lamellae. 'Without positive proof,' McIlvaine says, 'no one would suspect either of these odd formations to be abortive of either Clitopilus abortivus or Armillaria mellea or any other fungus.' In view of other resemblances to the parasitized Coprini described above, it is quite possible that these monstrosities are due also to the presence of some parasitic agaric which for some reason is unable to produce carpophores." [Helen Sherman, Journal of Mycology.]

FIG. 157.—YELLOW CLUSTER-CUPS, or the *Ae-cid'-i-um* that grows on the Elder and distorts the branchlets and leaves. At *b* a ripe "cup" is shown; one of the germinating spores more highly magnified is figured at *c*.

FIG. 158.—HY-GROPH'-O-RUS E-BUR'-NE-US.—A common white Hy-groph'-o-rus, occurring in Europe and America. The gills in this species are strongly decurrent—and Atkinson says of the gills of all the species of this genus that "they are usually rather distant, the edge is acute or sharp, and gradually thickened toward the junction with the cap, so that a section of the gill is more or less triangular." The half tone was made from specimens collected by Supt. Hard and the writer at Chillicothe, Ohio, in woods by Paint Creek, Oct. 30, 1905.

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# Mycological Bulletin

## No. 51

*W. A. Kellerman, Ph. D., Ohio State University*
*Columbus, Ohio, February* 1, 1906.

THE HALF-TONES IN THIS NUMBER.—The first illustration here given is of a fungus not of course important from an epicure's point of view, but what is more interesting and beautiful than these little double-walled Puff-balls! The outer *peridium* (*i. e.* layer of the covering) splits somewhat regularly from the top, becomes strongly reflexed, and hence the name *Ge-as'-ter* or Earth Star is an appropriate one. They retain their shape when mature and can be kept in small boxes for study or compari-

FIG. 159.—EARTH-STAR. GE-AS'-TER- TRIP'-LEX.—A rather common plant here shown in natural size. The cut was made from specimens sent by Supt. M. E. Hard, who collected them near Chillicothe, Ohio, November 9, 1905.

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son. The Polypore shown on the third page is nearly as ornamental as any of these species become—and the cut falls far short of doing the plant justice. The ma-ras'-mi-us is perhaps one of the most common—certainly, most beautiful— of the hundreds of Ma-ras'-mi-i. Aside from lack of natural color the half tone does not malign this interesting and charming little plant.

## "QUOTATION PAGE."

QUOTATION.—The phalloid, usually called stink-horn, for obvious reasons, is so common that the item below relating to variability may well receive our attention for a moment at least. The article was published in the Journal of Mycology, by A. H. Christman.

"VARIABILITY IN OUR COMMON SPECIES OF DICTYOPHORA.—Considerable uncertainty has existed as to the identification of our common species of Dictyophora. Fischer remarks that nowhere among the Phalloideae is the confusion in the nomenclature so great as in the case of this genus and he believes that this confusion has been brought about by the naming of isolated specimens which have been given new specific names on the ground of some slight lack of agreement with descriptions already given

* * * The occurrence of this common Dictyophora—in unusual numbers in the neighborhood of Madison during the summer of 1903, made it possible to make some interesting observations on the variability of the characteristic parts of the fungus. The specimens were found in the region lying along the south shore of Lake Mendota and extending a mile west of the city. The soil of this region is covered with a sod shaded at places by growths of trees and is at other places completely open. Along a drive, leading through this tract, young forest trees had been planted from year to year. There is also a plot of about four acres on the University farm planted about eight years ago with various young forest trees. All of these young trees had been liberally mulched yearly, from the time of planting, with a fertilizer composed of equal parts of shavings and dung, and it was in and beneath this mulch that the fungi were most abundant.

So numerous were the plants on the entire region that for a period of six weeks specimens could be found every day. As many as two dozen were often taken on a single morning. Probably as many as three hundred specimens were handled during the season. These were examined and types of all sizes and proportions were carefully measured and then preserved by drying or in alcohol. When it was desired to get a series of plants belonging to the same mycelium, certain clusters of the eggs were marked and specimens gathered from day to day as they matured.

In making the measurements it was aimed to secure specimens showing all possible variations. The following table gives the dimensions of twenty plants including specimens showing the extreme variations in all of the characteristic parts of the plant. The specimens are arranged in the table according to height. [Table omitted].

It will be seen that the extremely tall and extremely short specimens are not so numerous in the above table as are the more nearly average ones. As these are about equally scarce also in nature the above averages may safely be taken as approximately correct for all the specimens found during the season.

There is a fairly complete series from the shortest (5.6 cm.) to the tallest (21.2 cm.). Careful observations were made to determine, as nearly as possible, what conditions might be responsible for the height of the specimen. It was found that without exception the tall plants were solitary, were taken from sod, and, in almost every case, were in a fairly shaded, moist locality. Numbers 1 to 6 of the table, and many others, were found so located. The smaller specimens were found where the plants occurred in large clusters and were often taken after several plants in the cluster had matured. When a plant in the egg stage was found on a substratum, such as the mulch already mentioned, that readily became dry,

CONTINUED IN NEXT NUMBER.

FIG. 160.—PO-LY'-PO--RUS BRU-MA'-LIS.—A Polypore very common in the middle and latter part of the season having rather small pores; it is more or less smoky on the cap above, below nearly white. From specimens collected by A. L. Smith, Columbus, Ohio.

FIG. 161.—MA-RAS'-MI-US CAM-PAN'-U-LA-TUS.—A beautiful ochraceous-red cap delicately poised on slender shining black stems—no trouble to recognize from this figure. Specimens collected at Columbus, Ohio.

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# Mycological Bulletin

## No. 52

*W. A. Kellerman, Ph. D., Ohio State University*
*Columbus, Ohio, February* 15, 1906.

OUR ILLUSTRATIONS.—The *Boletus Americanus* shown on this page needs little or no comment, but the outline illustrations on later pages require further explanation. That on the third page is an *Aecidium* much like the species shown on page 199; the figure on the last page shows a *Smut;* the Aecidium will be briefly explained below, and the Smut will be commented on in the next Number.

FIG. 162.—BO-LE'-TUS A-MER-I-CA'-NUS.—A yellow-cap slimy Boletus occuring in woods and open places. The specimens from which the photograph was made were sent by Supt. M. E. Hard, Chillicothe, Ohio, Oct. 30, 1905.

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Ae-cid'-i-um, or Cluster-cups.—As already explained this represents a stage, usually marked as "I," of a Black Rust. The second or so-called Red-rust is indicated by "II" and the third stage or Black-rust is numbered "III." The remarkable thing about an Aecidium is that its spores do not grow on the host on which they are produced but often on germinating enter a grass or sedge or some other host and there the stages "II" and "III" unfold. This was not at first known, but each Aecidium was supposed to be a complete plant and of course each received a scientific name. It was a German botanist, DeBary, who nearly a half century ago proved by culture in his laboratory that the aecidium on Barberry was the first stage of one of the Red and Black Rusts that grow on wheat. Later experiments have shown the connection of many of our common Yellow Cluster-Cups with Red and Black Rusts on various hosts -yet the life cycle of very many of our common species remain to be worked out.

## "QUOTATION PAGE."

(*Continued from page* 202)

it could be predicted with certainty that the resulting fungus would be small. Very immature eggs (½ to ¾ size) were often separated from their mycelial connections and taken into the greenhouse. These often decayed. A good share of them, however, developed after several days producing very small specimens. This indicates that food and moisture, together with the habit of growing singly or in clusters are important factors in determining size.

The volvae varied in size from 5.5 x 6 cm. to 2.4 x 3 cm. Where the eggs were in large groups they were often flattened against each other. A peculiar lobing was often caused in this way and also by foreign objects lying in contact with the eggs. Eggs lying free in sod were spherical and smooth. The color of the eggs varied from white to pink or dirty brown.

The size and shape of the pileus was as variable as the other characteristics. the taller plants in general had the larger pilei. The shape varied from a broadly campanulate pileus, 2.7 cm. high by 3.7 wide at the lower margin in No. 16, to the tall conical pileus 4.2 cm. high by 2.6 in diameter at the base as in No 11. There is no correlation between the shape of the pileus and the size and structure of the other parts. Some very tall specimens had campanulate pilei while others had the conical form, the same was true of the small specimens. The outer surface was always conspicuously reticulated, the edge of the ridges being acute and toothed. The ridges always extended to the pore at the apex. The pits enclosed by the ridges were in general deeper midway between the apex and the margin of the pileus and often became elongated in the vertical direction near the margin. * * *

There is no other part of the whole plant that shows as great variation in both size and structure as does the veil. The veil of a given specimen may vary with the age of the specimen when collected, or with the surrounding conditions. It was often observed that the veil expanded after the stipe had fully elongated. In other specimens the expansion of the veil was more rapid than the elongation of the stipe. In such cases the veil protruded from between the pileus and the volva as a large fold, which later straightens out and hangs free when the stipe is fully extended. When a specimen had been exposed to a dry atmosphere for a short time the veil became much shrunken. The measurements given in the table were taken from specimens gathered at about ten o'clock in the forenoon. Care was taken to measure the length of the veil when it was most fully expanded. While the outside conditions in which the plant is found, may modify the dimensions of the veil, there is no doubt that the actual amount of material which enters into it is as variable as any other feature of the plant.." [A. H. Christman, Journal of Mycology].

FIG. 163.—AE-CID'-I-UM IM-PA-TI-EN'-TIS.—The Yellow Cluster-cups of *Impatiens*, the Wild Touch-me-not, or Jewel-weed. At *b* is shown a ripe "cup" and at *c* one of its germinating spores.

FIG. 164.—U-RO-CYS'-TIS CAR-CI-NO'-DES.—The Smut found on *Cimicifuga*, the Black Snake-root or Bugbane.

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# Mycological Bulletin

## No. 53

*W. A. Kellerman, Ph. D., Ohio State University*

*Columbus, Ohio, March* 1, 1906.

SOMETHING ABOUT SMUT.—In the preceding number we gave an illustration (Fig. 164) of a kind of parasitic fungi which are very common, namely, the Smuts. The figure referred to shows a plant, the common Bugbane or black snake root (*Cimicifuga*) distorted by a Smut-fungus. The plant became abnormal in consequence of the attack of this parasite and when the mass of spores of the latter became nearly or quite ripe, they ruptured the epidermis and the black powdery mass escaped. When examined under the microscope the "smut" proves to be a multitude of little round bodies as shown in the figures (*b*, *c* and *d*). These germinate—showing that they are reproductive bodies of plants multiplying the species as do seeds in case of the higher plants. They are much simpler in structure than are seeds and are called *spores*. At *d* in figure 164 is shown a spore that has germinated.

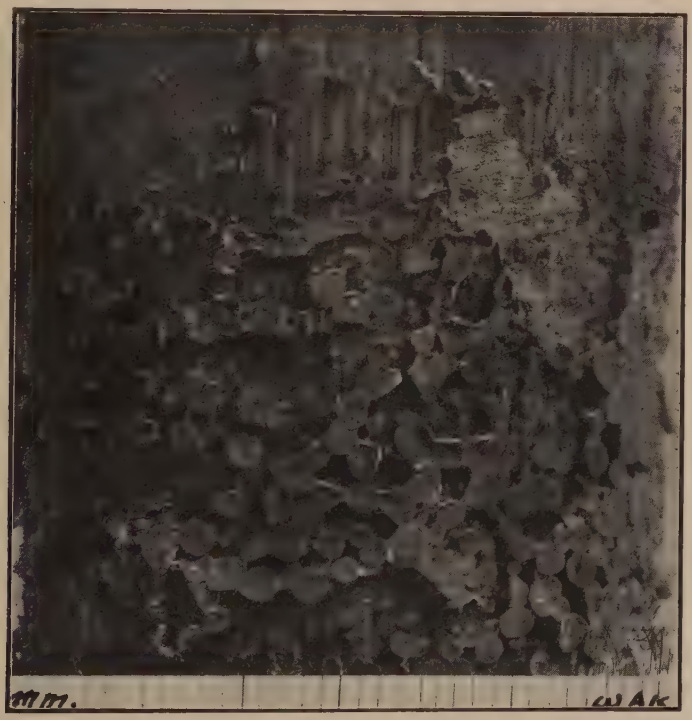

FIG. 165.—HE-LO'-TI-UM CI-TRI'-NUM.—An attractive little Disc-fungus, yellow in color, growing on rotten logs in very damp places. The scale at the bottom shows the extent of the slight magnification. The spores are not borne on gills, pores, spines, etc., as in the case of those called Ba-sid-i-o-my-ce'-tes, but the cups (or saucers) contain a compact layer of large cells *within which the spores are borne.* It belongs to the *Dis-co-my-ce'-tes* (which is a large group of the As-co-my-ce'-tes).

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## "QUOTATION PAGE."

QUOTATION—In the introductory part of the Mushroom Book we find the following readable paragraphs by Nina L. Marshall:

"Although for centuries it has been known that some fungi contain most virulent poisons, still, through ignorance of those points which distinguish the poisonous from the edible, frequent cases of poisoning occur in all classes of society. The mistakes resulting in death have been frequent enough to inspire the timid with an overpowering dread of all fungi, while the damp and grewsome places in which many fungi flourish have caused them to be despised by others. The following lines from Shelley very aptly express the general sentiment:

"And plants, at whose names the verse feels loath,
Fill'd the place with a monstrous undergrowth,
Prickly and pulpous, and blistering and blue,
Livid, and starr'd with a lurid dew.
"And agarics and fungi, with mildew and mould,
Started like mist from the wet ground cold;
Pale, fleshy, as if the decaying dead
With a spirit of growth had been animated."

Shelley: "The Sensitive Plant."

"To many people the only growths known as fungi are toadstools and mushrooms. They give the name mushrooms to the species known to them as edible, and regard all other similar growths as toadstools, things uncanny or poisonous.

"The grisly todestool grown there mought I see,
And loathed paddocks (toads) lording on the same."

Spenser's "Faerie Queene."

"This distinction has no scientific basis, and in fact most of the species called toadstools are edible. Fungi are not always the grewsome things of Shelley and Spenser. In their ranks are many which delight the eye with their colouring and the symmetry of their forms. They are the grotesques of nature; nests, hoods, cups, umbrellas, shells, and clubs are represented, together with spheres, hemispheres, cones, and many other geometrical figures. The mildew on the linens, the mould on food, the rusts and smuts which blight our fields of grain, and the dry rot which crumbles our lumber to dust and which causes old wood in dark places to glow with a wierd, pale, flickering light, are all forms of one group or another of these plants which prey upon living or dead organic matter. In ordinary observation, only the simpler and more noticeable fungi are taken into account, but they are in reality met with in almost every situation imaginable. They are found in damp cellars and in rooms shut off from the light; in fact, some form of fungus will be found in every place and on everything which is not exposed to a circulation of fresh air.

"In woods and open fields the attractive forms are found. In shady woods the beautiful white 'bear's head' hangs on stately tree trunks, and the 'destroying angels' gleam white in the shadows on the ground. Shelving brackets, green or red or brown, encircle old stumps, or stand out stiff and white from the crumbling trunks of fallen moss-grown monarchs of the forest, while wood-brown toadstools huddle in groups among the fallen leaves. On the outskirts of the wood, green and red Russula vie with the flowers in the brilliancy of their colouring. Pink or violet Clavarias, dainty corals, border the wood path, and golden Clavarias lighten up the somber wood tints with their yellow branches. In dry pastures and along wood roads, puff-balls, large and small, send up their puffs of brown smoke, to the delight of every passing child who strikes them with a wand. On lawns and hillsides the Oreades cause fairy rings to grow. The fairy rings are circles, or parts of circles, of impoverished grass of a lighter colour and less luxuriant growth than that of the grass immediately surrounding the circle. Before the existence of fairy folk came to be doubted, it was firmly believed that these fairy rings were the dancing grounds of the fairies.

"The nimble elves
That do by moonshine green sour ringlets make
Wherof the ewe bites not; whose pastime 'tis
To make these midnight mushrooms."

Rev. Gerard Smith.

[Nina L. Marshall, the Mushroom Book].

FIG. 166.—CLI-TOC'-Y-BE FLAC'-CI-DA.—A small white-spored white Mushroom, rather firm in texture growing in shady places in moist woods. See also next figure.

FIG. 166.—CLI-TOC'-Y-BE IN-FUN-DIB-U-LI-FOR'-MIS.—Very much like the preceding (Fig. 166); in fact, they may represent the same species. This and the preceding were made from photographs of specimens collected near Columbus, Ohio.

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# Mycological Bulletin

## No. 54

*W. A. Kellerman, Ph. D., Ohio State University*
*Columbus, Ohio, March* 15, 1906.

A GUATEMALAN FUNGUS.—We give below an illusration of a large Shelf-fungus found in abundance in Guatemala. It is a dirty white color and of size varying from an inch or two to eight inches or more in width. The upper surface is often somewhat honey-combed, and altogether a striking form. It is somewhat peculiar according to Dr. W. A. Murrill to whom speciments have been sent for study. Fig. 169 shows a portion of 168 under side, somewhat magnified.

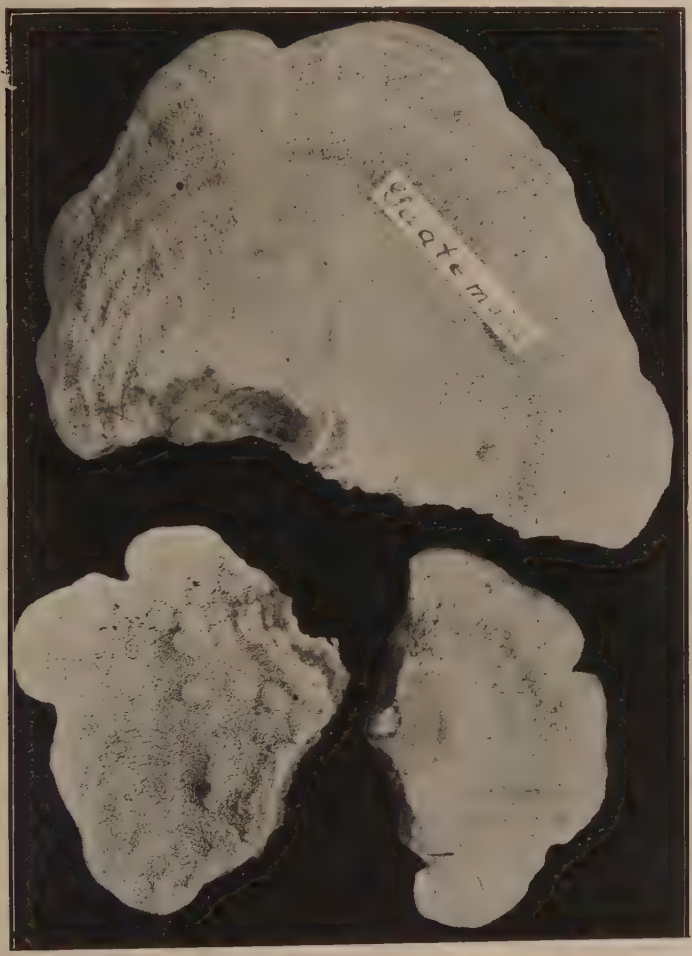

FIG. 168.—TRAM'-E-TES EL'-E-GANS (or Dae-da'-le-a el'-e-gans). A shelf-fungus of tough almost woody texture collected at Livingston, Guatemala. The larger specimen and the one to the right exhibit the upper side, the one to the left the under side All mach less than natural size. See Fig. 169.

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## "QUOTATION PAGE."

QUOTATION.—We find a popular article in an eastern newspaper that is not devoid of interest for would-be mycophagists. The author is Mr. Edward B. Sterling, Trenton, New Jersey:

"MUSHROOMS OR TOADSTOOLS; RULES.—For years the following apothegms have been handed down by those who should know better, and are still believed by many a housewife and mushroom gatherer.

"If you eat it and live, it is a 'mushroom;' otherwise die, because it is a 'toadstool.'

"If it grows in a 'dark place,' or on 'wood,' reject it.

"If your mushroom turns a silver spoon 'black,' it is unfit to eat. Throw it away.

"If 'salt' changes the 'color,' it must be poisonous. Drop it.

"If the skin 'peels' off easily, it certainly is an edible mushroom.

"Such nonsense has repeatedly been uttered in my presence. I have also heard, 'You will yet find a toadstool that will send you to the other world.' I have certainly found the 'other world' variety, but I have the power of discrimination developed sufficiently to reject such varieties as food.

"To prove the fallacy of the apothegms above mentioned, many varieties of toadstools have been enjoyed that immediately on fracture or touch have changed from a delicate orange, yellow, crimson and red to a dull blue, thence to a jet black. In fact, toadstools having all the colors of the rainbow have been tested and freely eaten.

"The peeling of the skin from the ordinary mushroom (Agaricus campester) is not only a waste of time, but the strength and aroma of the flesh is lost. The deadly toadstool (Amanita phalloides) can be peeled with ease. The delicious varieties of the showy Boleti family, which covers every tint known to nature, cannot be peeled. Many of those on the slightest touch or pressure of the finger show their delicate construction by immediately changing color, yet the delight of a fresh Boletus to a Mycophagist (toadstool eater), is the reward of a trip that should well repay the finder.

"Many varieties of toadstools, such as the Lactarius family (L. piperatus), (L. deceptivus), contain a white, hot, acrid milk, which in the raw state would soon raise a blister on the tongue. Many of the members of the Russula family (R. emetica) (R. fragilis) are hot as pepper, and in the raw state would cause vomiting, yet when any of the four mentioned varieties are properly cooked the acridity and peppery qualities depart and the food becomes edible and digestible.

"Botanists we have in every high school and college teaching the youth how plants grow, but how few of the professional class of botanists ever touch upon the subject of the value of food producing toadstools belonging to the lower order of plant life. Mycology should be taught in every school in this city and country. A botanist should be fully equipped for such duties. Specimens of the deadly amanita and of several of the edible species of fungi should be on exhibition in the class room. Education is greatly needed in this matter, and with such a rich amount of

fungoid growth in the vicinity of Trenton there is no valid reason why the subject should not have long since received proper attention.

"The foreign element, largely composing the laboring classes in this city, can be seen season after season scouring the woods in search of toadstools. While these foreigners are not able to give the names of that which they gather, they are brought up in their native countries to hunt for food. On one of my rambles through the woods adjoining Cadwalader park, one Sunday afternoon during the past summer, I counted no less than ten men and boys, with bags and baskets, gathering the hot and peppery forms of toadstools, which, when dried, they use for soups, gravies and seasoning. Not one of these ten persons could speak English fluently enough to give me the name of a single specimen, yet they knew what to take and what to avoid.

"Physicians should be mycologists. Outside of the Amanita muscaria (fly agaric) and Amanita phalloides (death cup), how many in this profession are able to identify the variety of fungi when called upon to treat supposed cases of toadstool poisoning? Ninety out of every one hundred cases of supposed toadstool poisoning reported in this country, if traced to the direct source and variety eaten established, would prove the fact that the patients have simply overloaded the stomach.

"Mushrooms should be used for a side dish and not the main feature of any meal. Eaten in proportion to the amount of other varieties of food upon the table they are a luxury, delicate, digestible and nourishing." [Edward B. Sterling, Hunterdon County, N. J. Democrat].

FIG. 169.—TRAM'-E-TES EL'-E-GANS.—The under side much magnified of specimen shown in Fig. 168.

FIG. 170.—HY-GROPH'-O-RUS LAU'-RAE.—A fine species collected in the rich woods along Paint Creek near Chillicothe by Supt. M. E. Hard, Oct. 30, 1905.

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# Mycological Bulletin

## No. 55

*W. A. Kellerman, Ph. D., Ohio State University*

*Columbus, Ohio, April* 1, 1906.

ACKNOWLEDGEMENT.—We are indebted to Mr. Carl Krebs of Cleveland for the photograph of specimen shown in Fig. 171, which represents one of the Stink-horn fungi or Phalloids. It differs from Dictyophora and Phallus (which we illustrated on pages 71 and 83) in the pileus being wholly adnate to the summit of the stipe, the gleba occupying its outer surface. The stipe is hollow within.

WHITE RUST.—This name is given to a group of parasitic fungi which are not real Rusts at all. They belong to a distinct group called the Phy-co-my-ce'-tes or Algal-fungi. We hardly need go into the botanical details which would weary a beginner—but suffice it to say that the family to which the fungus shown on page 220 belongs is that to which the Grape Mildew belongs, namely, *Per-o-nos-po-ra'-ce-ae*. We have selected this particular one, growing on the wild Potato-vine (*Ipomoea pandurata*) because it produces conspicuous distortions of the host; see *a* in Fig. 173. An interesting thing is this that the parasite produces two kinds of spores—*summer spores* and *winter spores*. The former are shown in the figure at *c* and one of the latter embedded in the tissue of the leaf, at *b*. The summer spores are white or nearly so, and a waxy white covering is to be seen just before they break through the epidermis for dissemination. The winter spores lie dormant till spring.

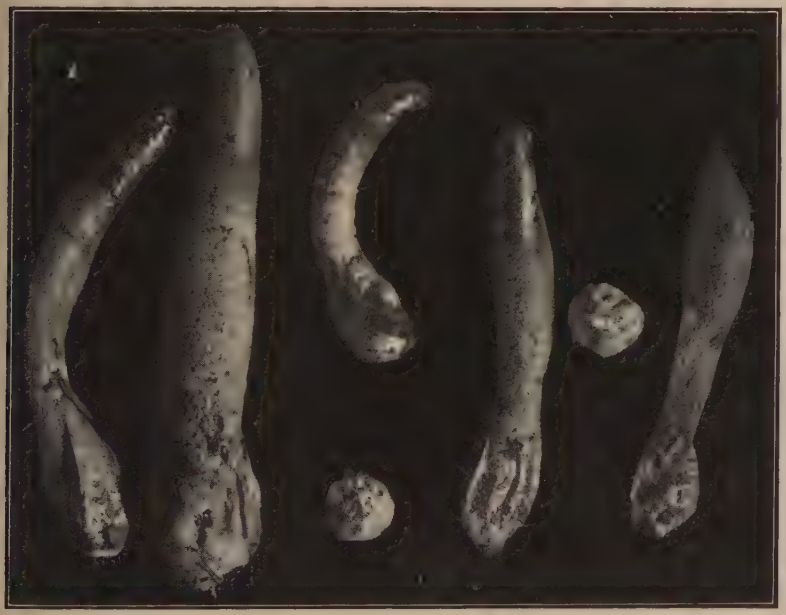

FIG. 171.—MU-TI'-NUS CA-NI'-NUS.—One of the Phalloids or Stink-horn fungi. See the first paragraph above. Photograph by Carl Krebs, Cleveland, Ohio.

University Bulletin, Series 9. No. 43. Entered as Second Class Matter, Post-office at Columbus, Ohio

## "QUOTATION PAGE."

QUOTATION.—The item we give below appeared in the Journal of Mycology and pertains to an interesting observation by Prof. Sturgis on the unseasonal occurrence of the Morelle:

"REMARKABLE OCCURRENCE OF MORCHELLA ESCULENTA (L.) Pers.—During a recent hunting trip in southwestern British Columbia the writer came across this fungus growing in such abundance and in a location and at a season of the year so unusual that the circumstances seem worth recording. Usually one expects to find *Morchella* in the Spring growing on the borders of meadows or other grassy places. In the present instance the plants were found in September on a steep mountain side which had, within a little over a year, been subjected to a destructive forest fire.

"On September 11th the writer was skirting the precipitous side of a mountain at an altitude of about 7,000 feet and while passing through what had been a fairly good growth of aspens and small spruces, a few fine specimens of *Morchella* were noticed. Further search revealed the presence of these plants literally in hundreds. A fire had passed across the mountain in June 1904, leaving only the skeletons of the trees standing and charring the ground to such a depth that no trace of green vegetation has since appeared. Under these unfavorable circumstances and at a season when snow had already fallen not far from the locality a bushel of *Morchellas* might have been gathered within a radius of one hundred yards. The specimens were exceptionally fine, in some cases attaining a height of seven inches and a circumference around the pileus of ten inches. In such specimens the pileus usually showed a great variety of form, from conical and flattened to nearly spherical. In other cases the pileus more nearly resembled that of *M. conica* Pers. The base of the stipe was in all cases much swollen and consisted of a mass of mycelium and soil cemented into a sclerotoid mass. Specimens were secured from which the identity of the fungus was later determined.

"The interesting question arises whether, on the western slopes of the Rocky Mountains, *Morchella* usually occurs in the Autumn rather than in the Spring as elsewhere, and also how the presence of the particular specimens is to be accounted for. It is hardly possible that the spores could have been carried to the locality in sufficient quantity to have produced in one season so large a growth of plants, and it is almost equally inconceivable that a subterranean mycelium could have resisted a degree of heat sufficient to destroy permanently all surface vegetation and leave the ground a desolate waste of charred clay." [W. C. Sturgis, Journal of Mycology.]

QUOTATION.—An extremely interesting letter was received during the summer from Mr. Pierson L. Halsey, secretary of the Wisconsin Mycological Society, Milwaukee. We reproduce such parts as make plain the matter referred to:

"I enclose with this mail a small package and specimens of a common mushroom in gardens. * * * *

"On Saturday, July 8, 1905, the family of J—— E——, of our city, was reported in the press as seriously poisoned by eating toadstools from their garden. I forthwith investigated yesterday morning, getting the remains of specimens, the cut-off stems, one of the enclosed, and whatever were left, which was very few. Also the reports of the two attending physicians in full. There is no possible doubt as to this being the only mushroom eaten.

"They were cut, something over a pound, from the kitchen garden beneath potato vines, rich, sandy loam, highly fertilized, and immediately fried gills up with butter, salt and pepper, in a large dripping pan, full. Mr. E—— ate very heartily (he says he ate a pound, which is questionable). Mrs. E——and two little girls, aged 10 and 8, ate only a few, the girls not over ten caps each. About ten minutes after their meal Mr. E—— came in feeling very dizzy and found his wife resting on the table complaining of being queer; in about ten minutes the girls complained of dizziness and tired feeling in the limbs and arms. Mrs. E——'s arms and hands were trembling and she had 'no strength' and she couldn't 'see

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W. A. KELLERMAN, Ph. D., Ohio State University

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plain;' they called the doctor by phone, Dr. C. H. Lewis and Dr. Hankwitz both coming within five minutes of each other and within forty minutes after their meal., i. e., at about 7:45. Mrs. E—— had meanwhile given a teaspoonful of raw mustard to Mr. E.——and less amount to the children and self. All drank much fresh milk.

"Dr. Lewis arriving, found Mr. E—— prostrated, too dizzy to walk; he had vomited some, as had the little girl. All were dizzy, trembling, and Mr. E—— frightened. Both Mr. and Mrs. E——perspired profusely; pulse not much above normal. No griping or pain; only weakness and vertigo, except that the mustard and excessive draughts of milk distressed somewhat.

"Treatment—Teaspoonful of fluid extract ipecac (and one-half to girls) in warm water, followed in Mr. E——'s case with hypodermic 1-150 gr. atropin with strychnia. The dizziness continued all the day and following night, but all felt well yesterday morning except for headaches, and are well to-day As the caps were small, and placed close in the dripping pan, there may possibly have been 75 or thereabouts, his hat full Their breakfast at about 7 o'clock consisted of coffee, bread and butter, these fried mushrooms and strawberries (with sugar), freshly picked from their garden. No paris green or other insecticide had been used in the garden. * * * " [Pierson W. Halsey, letter, July 10, 1905.]

[The specimens, or part of them at least, were Amanita verna.—Ed.]

FIG. 172.—LAC-TA'-RI-US VO-LE'-MUS.—A species with abundant milky juice though "distinguished for its edible qualities." This specimen of deep lavendar color, was sent from Chillicothe by Supt. M. E. Hard.

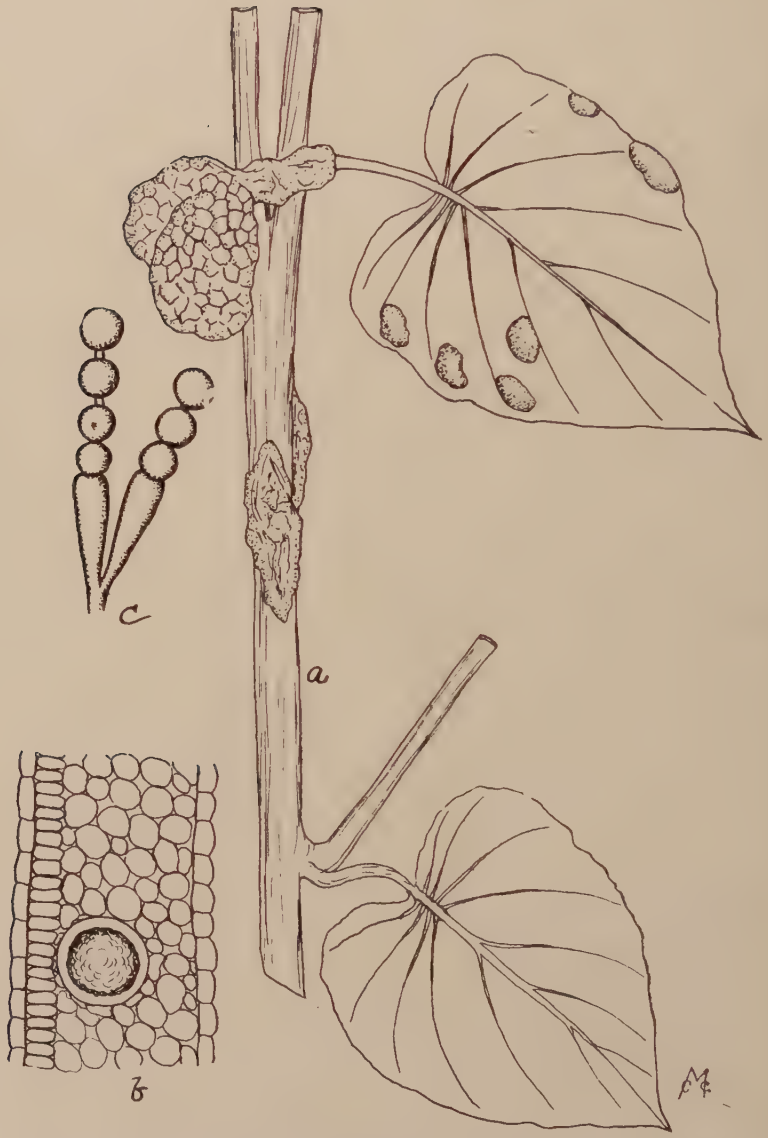


FIG. 173.—AL-BU'-GO IP-O-MOE'-AE-PAN-DU-RA'-TAE.—A "White Rust" causing distortions of the Wild Potato-vine. The summer and winter spores are shown at *c* and *b* respectively.

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# Mycological Bulletin

## No. 56

*W. A. Kellerman, Ph. D., Ohio State University*

*Columbus, Ohio, April* 15, 1906.

ACKNOWLEDGEMENT.—The photograph was furnished by Supt. M. E. Hard from which we made the cut below. The plant is a near relative of the Polyporus or Trametes, but the "gills" or "tubes" are in *concentric circles.* The name Cy-clom'-y-ces means: circular (*cyclos*), fungus (*myces*).

FIG. 174.—CY-CLOM'-Y-CES GREENE'-I.—A rare "Polypore," with concentric "lamellae" or "tubes." Supt. M. E. Hard, Chillicothe, Ohio.

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## "QUOTATION PAGE."

QUOTATION.—Notes on Fungi were published by Dr. John W. Harshberger in the *Journal of Mycology*, and certain parts are here transcribed:

"BOX TORTOISES AND TOADSTOOLS.—The common box tortoise (*Cistudo virginica*) of our eastern woodlands is extremely fond of a rather frequent toadstool, *Russula virescens* Fr. A number of caps of this fungus, found in the woods at Primos, Delaware Co., Pa., on August 7, 1901, were gnawed in a rather jagged manner. Later, a tortoise was found immediately in front of a large light green Russula. It stopped work upon the approach of the observer, and although it was watched for some time, it remained perfectly quiet and alert. An inspection of its horny beak, however, revealed torn fragments of the toadstool smeared over the horny surface. I, therefore, succeeded in connecting the tortoise with the torn aspect of the fungus.

"PEZIZA REPANDA WAHLENB. IN PENNSYLVANIA.—McIlvaine in his book, 'One Thousand American Fungi' (p. 558), gives the distribution of this fungus, as: New York, Ellis; Minnesota, Johnson; Ohio, Lloyd; Pennsylvania, Miller. It occurs, according to him, on the ground, or on decaying wood. M. C. Cooke (Handbook of British Fungi II, p. 669) mentions it as one of the British funguses occurring on the ground and on stumps. It was discovered by the writer at Sherwood, near Angora, Philadelphia on an old rotten log in very considerable abundance. The specimens collected, some two or three hundred in number, varied in size from the diameter of a ten cent piece to one or two, or three inches across. The individuals were clustered, or disposed singly; some were saucer-shaped, others deeper and more bowl-shaped. The color was nearly white on the outer surface and a light, yellowish-brown color on the concave inner side.

"SPORE DISCHARGE IN PEZIZA BADIA PERS.—A considerable amount of this ascomycete was found at Crum Creek, Penna., May 20, 1901. When gathered in the hand and held for a moment, a discharge of the spores took place with a puff, like the curling smoke at the muzzle of a discharged gun. At intervals of several minutes, the same phenomenon took place until apparently all of the spores had been set free from the asci.

"CLITOPILUS ABORTIVUS B. & C.—The statement is made in an authoritative work on the fungi of North America, that 'the fungus is so named because of the abortive form of it frequently found associated with it.' From this sentence, one would infer, that the normal form is more abundant than the aborted one which is found with it. Nevertheless in the season of 1901, the aborted plants were by far the most abundant in the neighborhood of Philadelphia. A search through several woods was rewarded by the collection of many specimens of the rounded, egg-shaped, aborted form and only a few examples of the normal gill-bearing fungus." [John W. Harshburger, Journal of Mycology.]

ANOTHER FLY AGARIC.—The following interesting Note we owe to Supt. D. R. Sumstine, of Wilkinsburg, Pa.:

"*Amanita muscaria* is called the fly agaric because infusions of it are poisonous to flies. It has now however a keen rival for this reputation in another species of this same genus. Last summer while drying specimens of *Amanita solitaria* Bull., a number of flies was attracted to them. After the flies had remained on the plants for a short time they fell over apparently dead. This continued until thirty-nine fly mycophagists had become the victims of some narcotic contained in the mushrooms. The box with flies and plants was then set aside for future study. After two hours the box was again examined but the flies which once were dead were now alive and had departed with no more serious results possibly than a severe headache from their mycological "booze."

Several experiments were made with other specimens of the same species and the same results were obtained. It seems that this plant has some property that acts as an intoxicant or soporific to flies. It is reported by some writers as edible and by others as poisonous." [D. R. Sumstine, Journal of Mycology].

QUOTATION.—A Polypore on a leaf we would never expect, but perhaps there is something new under the sun. We quote from W. A. Murrill in Torreya:

"A New Polyporoid Genus from South America.—An interesting pore-fungus was collected a few years ago in Columbia by Mr. C. F. Baker. It is the only species of Polyporaceae known to me which occurs parasitic on living leaves. I have erected upon it the new genus *Phylloporia,* a description of which follows:

"Phylloporia gen. nov. Hymenophore small, tough, annual, attached by the vertex to the lower surface of living leaves; context brown, fibrous, tubes thin-walled, mouths polygonal; spores globose, smooth, pale ferruginous.

"The distinguishing feature of this genus is its habit of growing upon living leaves. It is based upon the following species:

"Phylloporia parasitica sp. nov. Pileus circular, thin, attached by its vertex to the under surface of living leaves, 5-8 mm. in diaemter, 0-2-1mm. thick; surface minutely tomentose, fulvous, margin thin, entire, ochraceous to ferruginous; context membranaceous, fibrous, ferruginous; tubes 0.5 mm. or less in length, 3-7 to a millimeter, isabelline, polygonal, irregular, edges thin, entire or coarsely dentate; spores globose, smooth, very pale ferruginous, 3-4 $\mu$; hyphae concolorous.

"Collected by C. F. Baker near Bonda, Colombia, Nov. 16, 1898, on living leaves of *Bignonia* (?). Numerous sporophores in various stages of development are found on the lower surface of the leaf, usually attached to a vein. This species is the only one of its family in America that occurs on living leaves. Looked at from above, the host appears to be attacked by a leaf-parasite and it is quite surprising to find on the lower surface the sporophores of one of the Polyporaceae." [William Alphonso Murrill, Torreya].

FIG. 175.—HY-PHO-LO'-MA SUE-LAT-ER-I'-TI-UM, in its native habitat, as photographed by Supt. M. E. Hard, Supt. S. Lawrence and the writer, near Ashville, Ohio, Oct. 14, 1905.

FIG. 176.—PLEU-RO'-TUS AP-PLI-CA'-TUS.—One of the neatest of all tiny gray sessile mushrooms,— a near relative of the Oyster Mushroom. It is shown natural size in its natural habitat, that is to say, on old bark of fallen logs. It thrives only in moisture; these specimens were found on the narrow neck of land hemming in a cove at Cedar Point, near Sandusky, Ohio. The large log was well shaded and these little plants throve in swarms.